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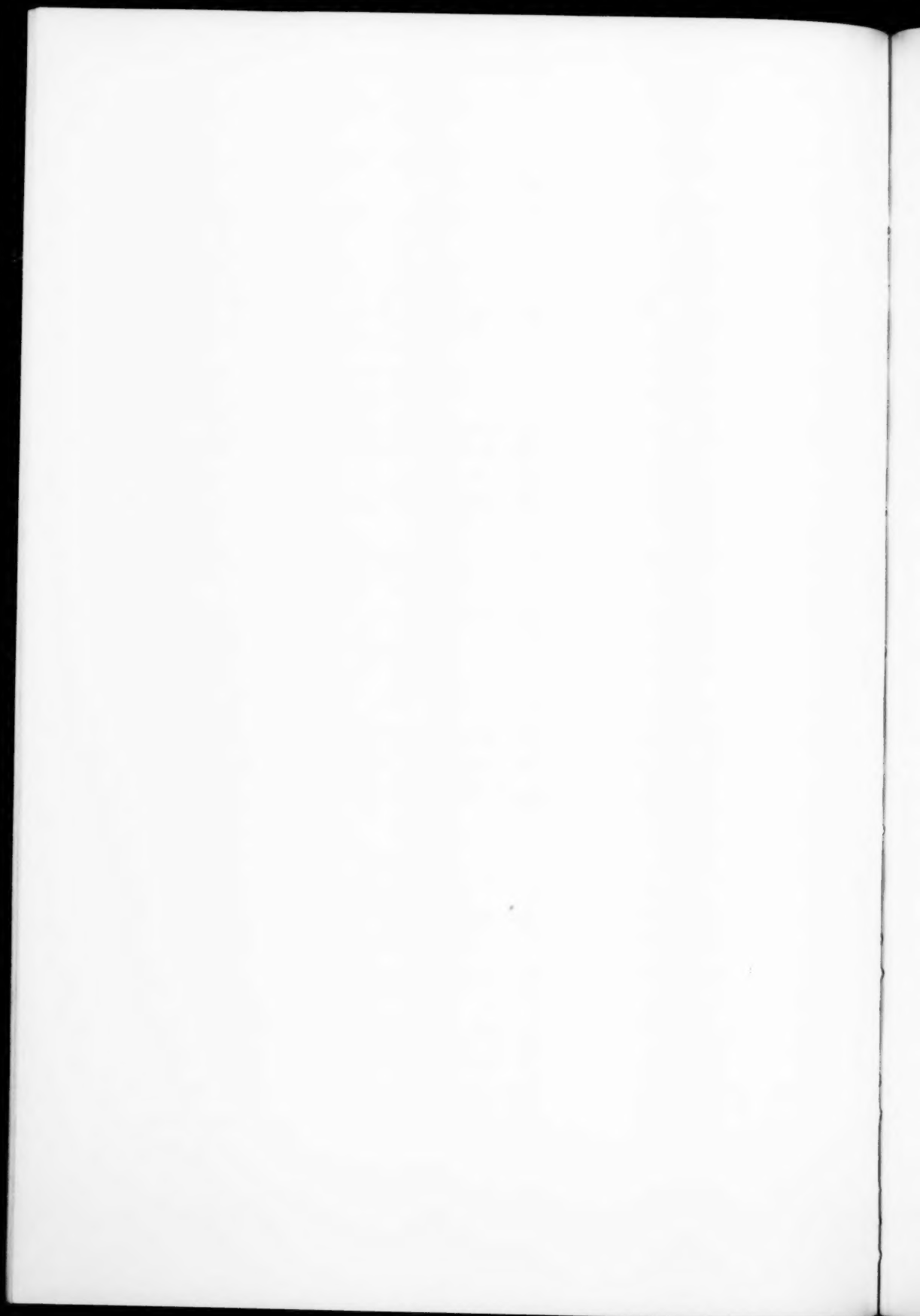


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BRAIN PATHOLOGY IN FOUR CASES OF SCHIZOPHRENIA TREATED WITH INSULIN*

BY A. FERRARO, M. D., AND G. A. JERVIS, M. D.†

The study of the problem of the effects of insulin upon the central nervous system has received new impetus since the application of Sakel's method to the treatment of schizophrenia. Although symptoms related to the central nervous system have a prominent part in the clinical picture of hyperinsulinism, the nature of the underlying brain pathology is still little understood. A review of the existing literature will show, in fact, that variable and often contradictory findings have been reported in both human and experimental material. The purpose of this paper is to contribute to the study of the morphologic aspects of the brain pathology of schizophrenic patients treated with insulin. Moreover, an attempt will be made to elucidate the mechanism by which these pathologic changes are likely to take place in hyperinsulinism. No claim is made, however, to any tentative explanation of the mechanism by which improvement or recovery, if any, are brought about by high doses of insulin. This last problem, obviously, is not pertinent to pathology.

Following a brief review of the literature concerning the brain pathology of hyperinsulinism, the clinical and pathologic features of four schizophrenic patients who died during a course of Sakel's treatment, will be presented and briefly discussed.

Review of the literature. The pathology of the nervous system of animals which were given various doses of insulin, has been studied by several investigators. Gozzano¹ found in rabbits diffuse severe lesions of the nerve cells following low doses of insulin. Circumscribed areas of cellular waste and hemorrhages were observed with higher doses by Schereschewsky, et al.² Stief and Tokay³ also described ganglion cell alteration either diffuse or patchy in distribution while Dünner,⁴ et al., stressed the finding of a marked proliferation of the vascular endothelium and new formation of capillaries. Productive alteration of the vessels and severe lesions

*From the department of neuropathology, New York State Psychiatric Institute and Hospital. Read at the meeting of the Psychiatric Society of the Metropolitan State Hospitals on February 6, 1939.

†Clinical material for this study was provided by Drs. H. J. Worthing, J. Notkin, J. M. Murphy, O. J. McKendree and F. J. O'Neill.

of the neuron cells were also found by Accornero.⁵ On the other hand, Schmid⁶ and Baker and Lufkin⁷ were unable to demonstrate any conspicuous cellular changes, while Grayzel⁸ correlated the cellular changes to convulsions rather than to insulin. Recently, Weil, et al.,⁹ experimenting with rabbits, found that injections of up to 70 u. of insulin over different periods did not produce microscopically demonstrable damage to the brain. Injection of doses from 70 to 150 u. were followed by mild histopathologic changes, while doses of from 20 to 400 u. injected over a period of two months severely damaged the cerebral neurons.

In human pathology, the effect of insulin on the nervous system has been studied, first, in diabetic patients who died in hypoglycemic shock following treatment with insulin. Wohlwill,¹⁰ Terplan¹¹ and Bodechtel¹² observed severe alterations of the neuron cells and regressive changes of the glia, while hyperemia and hemorrhages were described by Ehrmann.¹³ Recently, Baker¹⁴ described extensive pathology consisting of diffuse cerebral petechiae, multiple areas of softening and cyst formation. In addition, swelling and proliferation of the endothelial lining of many capillaries was observed.

Spontaneous hyperinsulinism, a condition which has much in common physiologically with insulin shock therapy, offers a second group of cases in which the neuropathology of insulin can be studied. While an apparently normal condition of the brain was found by numerous authors (Thalhimer and Murphy,¹⁵ Anderson,¹⁶ Smith and Seibel,¹⁷ Barnard,¹⁸ Wolf, et al.,¹⁹ Bowen and Beck,²⁰ Baker and Lufkin⁷), other investigators including Terbrüggen, et al.,²¹ Vonderahe,²² Moersch and Kernohan,²³ Scheller and Stroebe,²⁴ Malamud and Grosh²⁵ described extensive pathology dominated by severe alterations of the neuron cells.

A third group of cases consists of patients who died in hypoglycemic coma following insulin treatment. In a morphine-addicted patient who had received insulin treatment, Morsier and Mozer,²⁶ found diffuse involvement of the nerve cells, circumscribed acellular areas in the cortex and glia proliferation, mainly perivascular in distribution. There were also small hemorrhages and considerable hyperemia. Unfortunately, the total dose of insulin could not be ascertained.

Six reports on neuropathologic changes in schizophrenics who died following Sakel's treatment are available in the literature, thus far. The first (Leppien and Peters²⁷) concerns a catatonic male, aged 18, who received 132 u. of insulin in 15 days, the maximum dose being 25 u. The patient died in coma the fourth day after the last injection. Marked hyperemia and small perivascular hemorrhages were present throughout the central nervous system. The neuron cells were markedly altered. There was swelling of the endothelium of numerous small vessels and capillaries. The authors stressed the importance of vascular factors in the causation of the pathologic changes of the brain. The second case (Kobler²⁸) concerns a paranoid female, age 24, who received a total of 1,600 u. of insulin in 20 injections over a period of 11 weeks. The patient died following a prolonged coma of four days. The findings were those of marked neuron cell alteration and scarce glia reaction. The author places particular emphasis on the morphologic features of these changes which, in his opinion, indicate a direct toxic action of insulin on the ganglion cell. The third case was described by Kastein.²⁹ The patient, a catatonic female, aged 32 years, had received 9,600 u. of insulin in 75 injections. Death followed a prolonged coma of 20 days. The pathology of the brain consisted of severe and diffuse lesions of the nerve cells and proliferative changes of the blood vessels. The author is inclined to attribute the pathologic features to two orders of factors—toxic-metabolic and vascular. Another case has been published by Cammermeyer.³⁰ The patient, a male aged 37, received 680 u. of insulin during eight days. Death occurred the day following the last coma, during which status epilepticus was observed. Areas of ischemic softening were found in the cerebral cortex and the basal ganglia. The nerve cells showed characteristic ischemic homogenizing changes. Areas of cellular destruction were also noted. The case reported by Döring³¹ concerns a schizophrenic male, aged 29 years who died after the second coma of a second series of insulin shocks, no complication having occurred during the first series. The brain pathology was that of multiple hemorrhages and hemorrhagic softening. The sixth case has been recently reported by Timmers.³² The patient had received 15,000 u. of insulin over a period of five months, yet no pathologic changes of the central nervous system

were found. Finally, an additional case has been reported (Salm³³), in which histologic examination was incomplete; numerous hemorrhages were found.

CASE REPORTS

Case 1. G. A. (No. 271207),* a white male, aged 21 years, was admitted to Willard State Hospital on December 20, 1934, with the complaints of confusion and excitement.

The family history was negative for mental disorder. The personal history recorded no previous disease. The patient received a common school education and lived in a farm community where he was considered well adjusted.

The onset of the psychosis dated from 1931 and was gradual in progression. The first symptoms consisted of delusions of persecution and reference, followed, two years later, by a variety of bizarre complaints. In November, 1934, the patient became markedly confused, excited, and apparently hallucinated. He threatened to commit suicide and to injure other members of the family.

On admission to the hospital he was confused, restless, anxious and seclusive, exhibiting a silly, meaningless grin, and obviously hallucinating in the auditory field. When interviewed, he spoke very slowly, his answers being inadequate and incoherent. He complained of a variety of bodily disorders; he stated that he had been hearing the voices of God and the devil. Some preoccupation concerning sexual abnormalities and diseases was exhibited. Attention was poor inasmuch as the patient was apparently listening to a constant stream of imaginary voices. Personal identification, orientation and recent memory were good. School and general knowledge were fair. Physical examination was negative.

A few weeks after admission, a marked change occurred. A typical catatonic reaction was observed. The patient became uncooperative, negativistic and untidy. This condition remained unchanged for the two years following.

On August 29, 1937, hypoglycemic treatment according to Sakel's method was instituted. The initial dose of 40 u. was gradually increased to a maximum single dose of 320 u. This dose was reached September 27. On the evening of October 26, the patient suffered a relapse. However, a prompt intravenous administra-

*Clinical observations by Dr. H. J. Worthing and Dr. J. M. Murphy of Willard State Hospital.

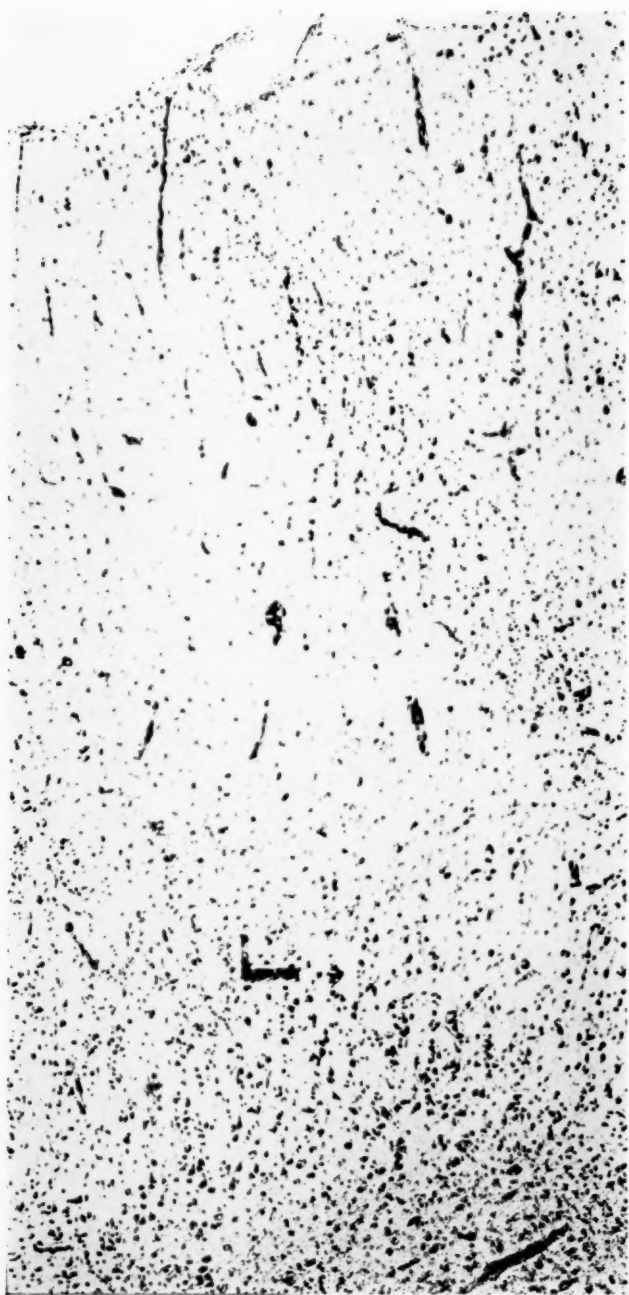


Fig. 5—Circumscribed area of cellular waste. Nissl stain, low power.



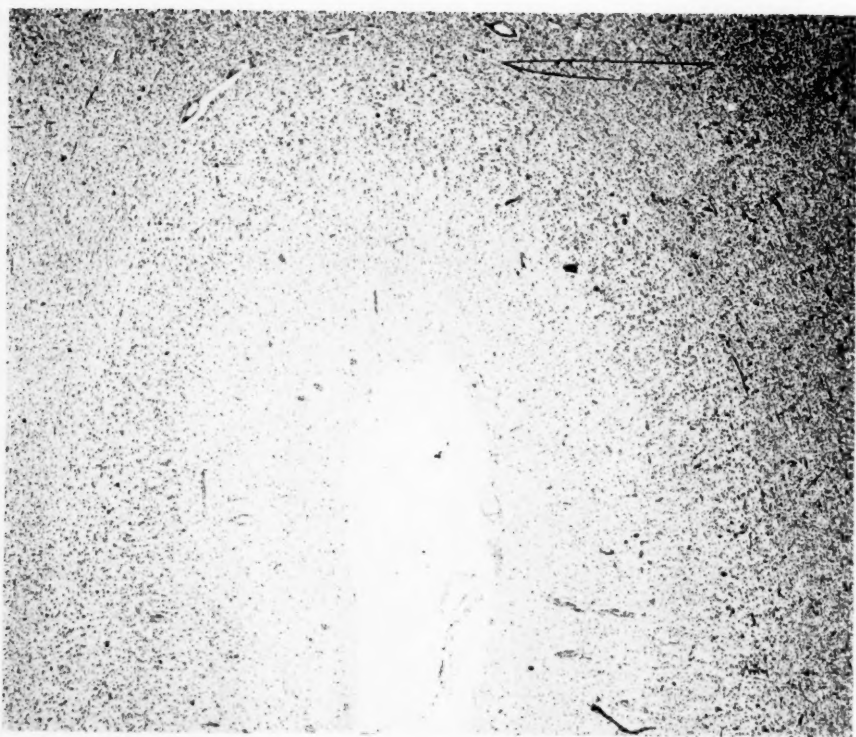


Fig. 4—"Dropping out" of neuron cells in the external area of the cortex.



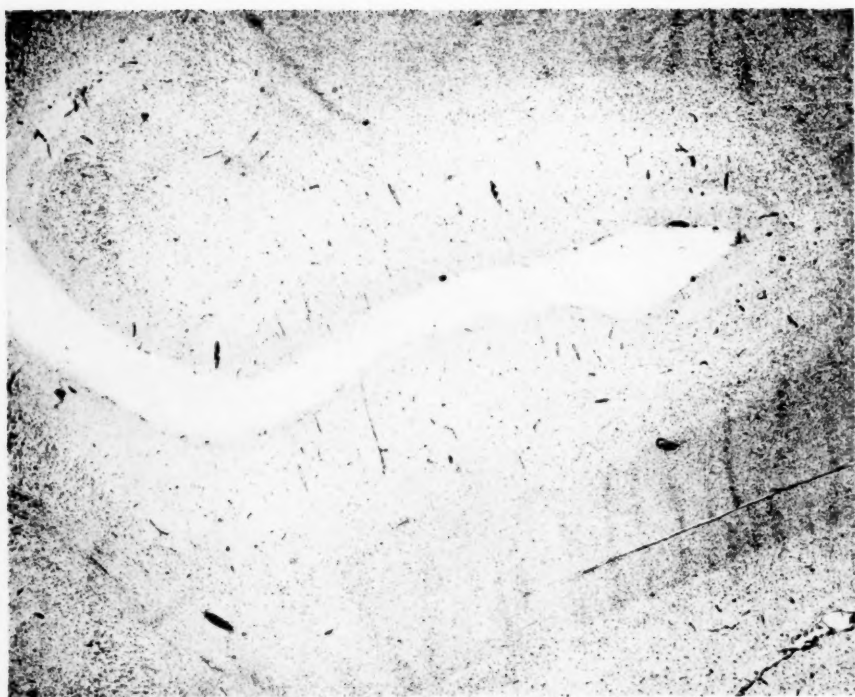


Fig. 3—Large area of cortical devastation. Nissl stain, low power.



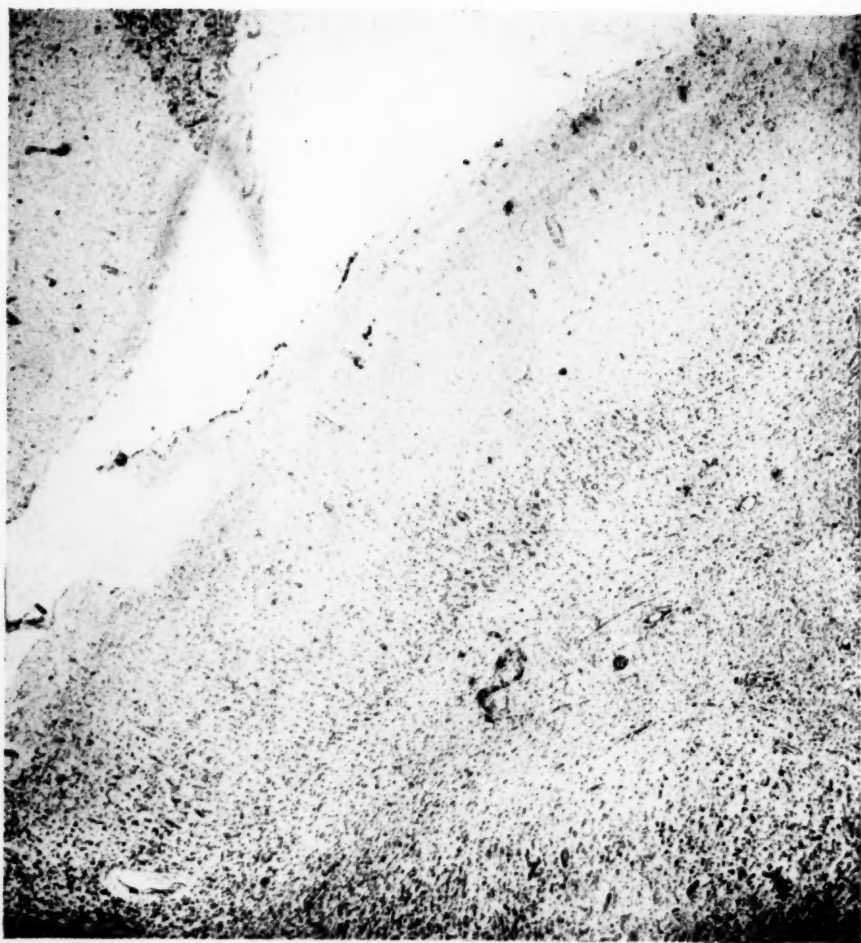


Fig. 2—Area of cortical "devastation" with almost absent glia reaction. Nissl stain, low power.

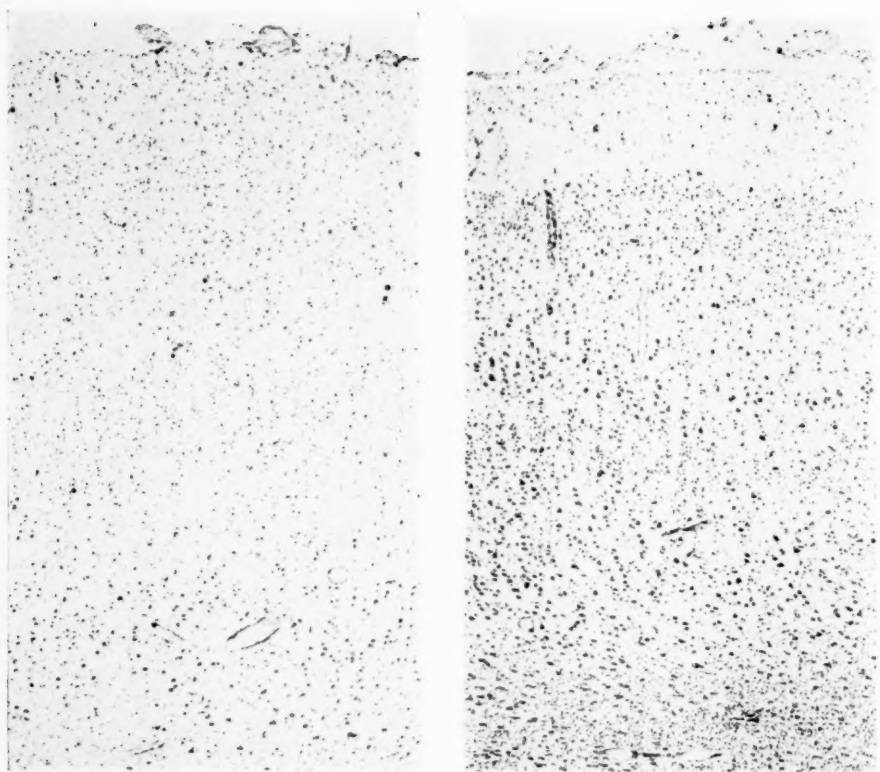


Fig. 1a--Area of cortical "devastation" with scarce reaction. (Region TA of Econarro.) Case 1. Nissl stain.

Fig. 1b--The same region in the same case showing a much better preserved lamination.

tion of glucose brought him back to consciousness but he became very noisy and disturbed. Treatment was suspended. On October 28, he again became stuporous. Pulse and respiration were increased in frequency and an elevation of temperature was observed. During the following seven days his condition remained unaltered. He died November 4, 1937, without regaining consciousness.

The total number of treatments amounted to 44, the total dose being 11,400 u. There were 35 comas and 205 hours of hypoglycemia. Convulsions were observed twice.

The autopsy was performed three hours after death, no significant gross somatic changes being found. The brain (No. 1809) appeared normal on external examination. However, the vessels were definitely congested throughout.

Histological study was carried out with the usual method of neuropathologic technique.

1. *Cerebral cortex*: With Nissl stain, lower power examination showed striking changes in the cerebral cortex. In some areas, the whole cortex appeared lightly stained, the ganglion cells had disappeared almost completely, and the glia elements had mildly proliferated (Fig. 1). Destruction of the nerve cells was occasionally seen without accompanying glia reaction (Fig. 2). The cellular devastation extended at times over a long tract (Fig. 3), often confining rather abruptly with much better preserved areas. There was no apparent shrinkage of the tissue, so that the cortex appeared of normal thickness. At times no apparent vascular lesions were observed within the areas. However, major cellular destruction usually coexisted with alterations of the small blood vessels which will be described later. While in some areas most of the six laminae were involved uniformly, in others the first three or four cellular layers were more severely damaged (Fig. 4). At other times, the cellular waste appeared to involve particularly the third layer, the lesion extending over a relatively long tract.

Low power examination of Nissl specimens disclosed another type of involvement consisting of small, roundish areas of cellular waste (Fig. 5). They were scattered irregularly in the various layers, at times occupying a single layer, at others extending over

two or three layers. Some areas were sharply defined; others showed ill-defined borders.

In the Ammon's horn region a characteristic change was present, consisting of a total dropping out of the neuron cells in the pyramidal layer of the Sommer sector (Fig. 6). In this area of cellular waste it was noticed at times that the glia had proliferated and that numerous rod cells were present. On the border, between the lesion and the normal tissue a large number of ganglion cells showed ischemic changes.

The cytoarchitectural alterations were unevenly distributed throughout the cortex, being frequent in the occipital and temporal lobes, scarce in the frontal and parietal lobes. In the same regions there were sections with no apparent alterations whereas others disclosed various types of lesions.

High power examination of Nissl preparations showed that few of the nerve cells in the cerebral cortex appeared normal. A certain number of the cells were swollen and globular, the cytoplasm being homogeneous and lightly stained, the Nissl bodies disintegrated and the nucleus eccentrically located. Numerous other cells were shrunken, deeply stained, with eccentrically located, irregular nuclei and distorted dendrites. Other cells appeared elongated and triangular with sharp angles, the cytoplasm being homogeneous and eosinophilic, the nucleus eccentric and dark, the nucleolus deeply stained (Fig. 7). These cells closely resembled the "ischemic" cells of Spielmeyer. Neuron cells showing "colliquation" with vacuole formation in the cytoplasm, or more rarely in the nucleus, were also present. Shadow cells and neuronophagia were frequently observed. Although present throughout the whole cortex, these cellular lesions were especially marked within or in the vicinity of the areas of cellular devastation, above described.

The observation with Bielschowsky technique confined the data obtained with Nissl's stain. In numerous cells, the nuclei appeared altered and the neurofibrils were broken down in dusty fragments.

Preparations stained with scarlet R showed a considerable amount of bright red, fine droplets of fat in the cytoplasm of numerous cortical neurons. Especially involved were the pyramidal cells of the third and the fifth layers. Considerable fat degeneration was noticed in the Ammon's horn where most of the pyramidal

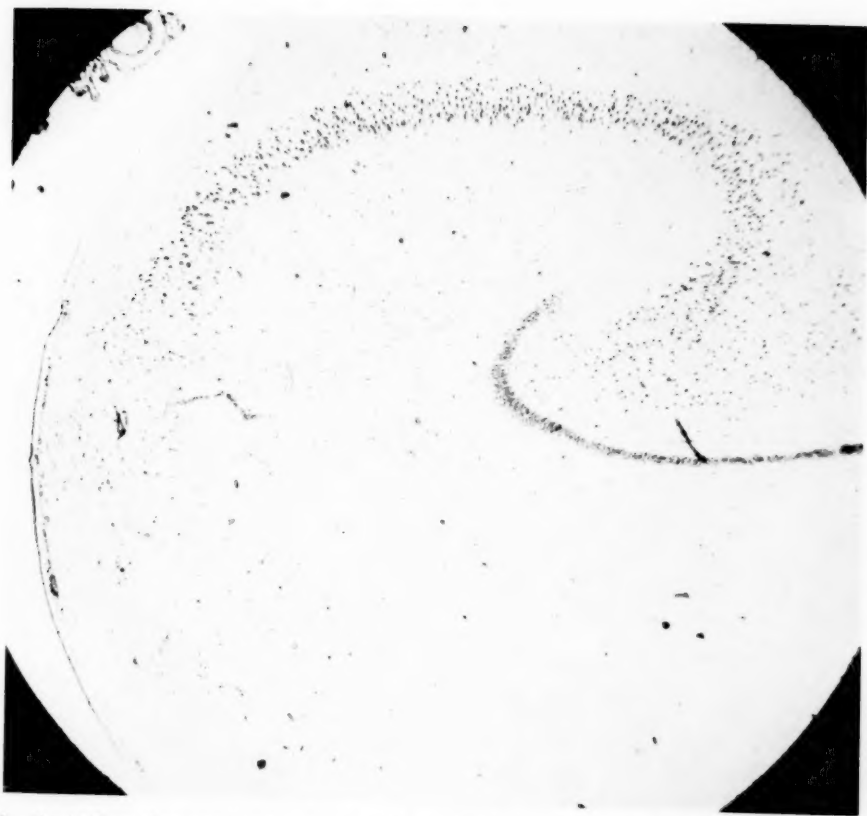


Fig. 6—"Dropping out" of neuron cells in the Sommer sector of the Ammon's horn.
Case 1. Nissl stain.

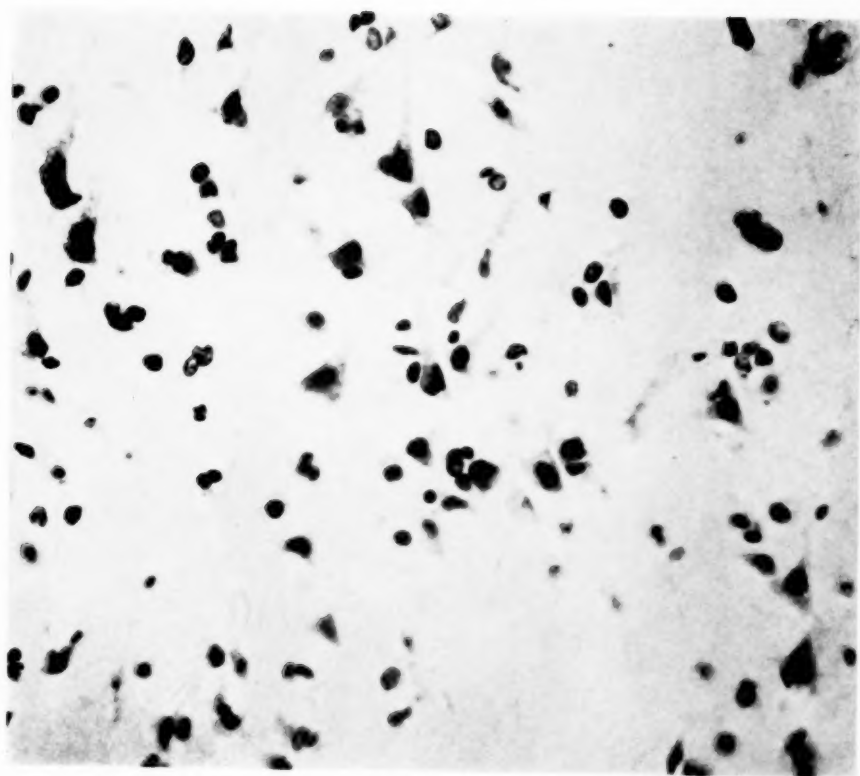


Fig. 7 -Nerve cell changes of the ischemic homogenizing type. Nissl stain, medium power.



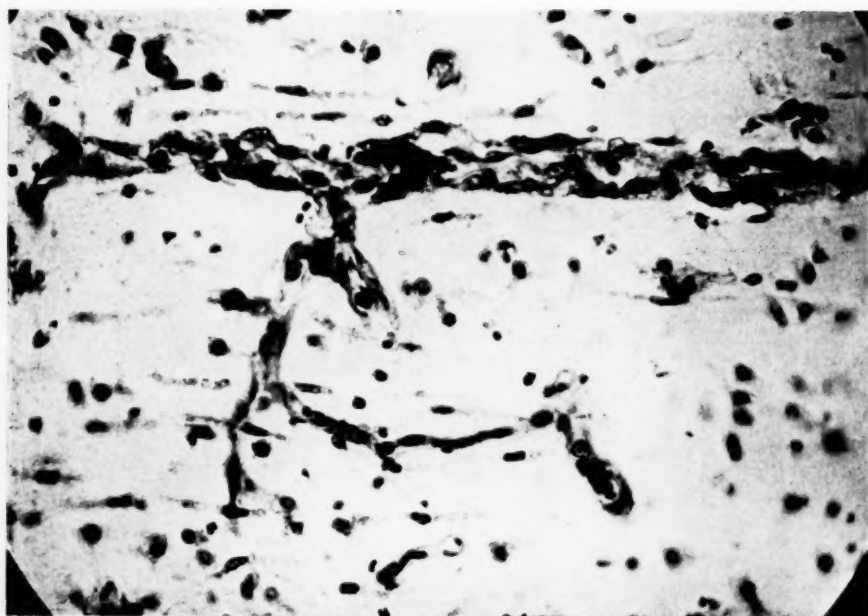
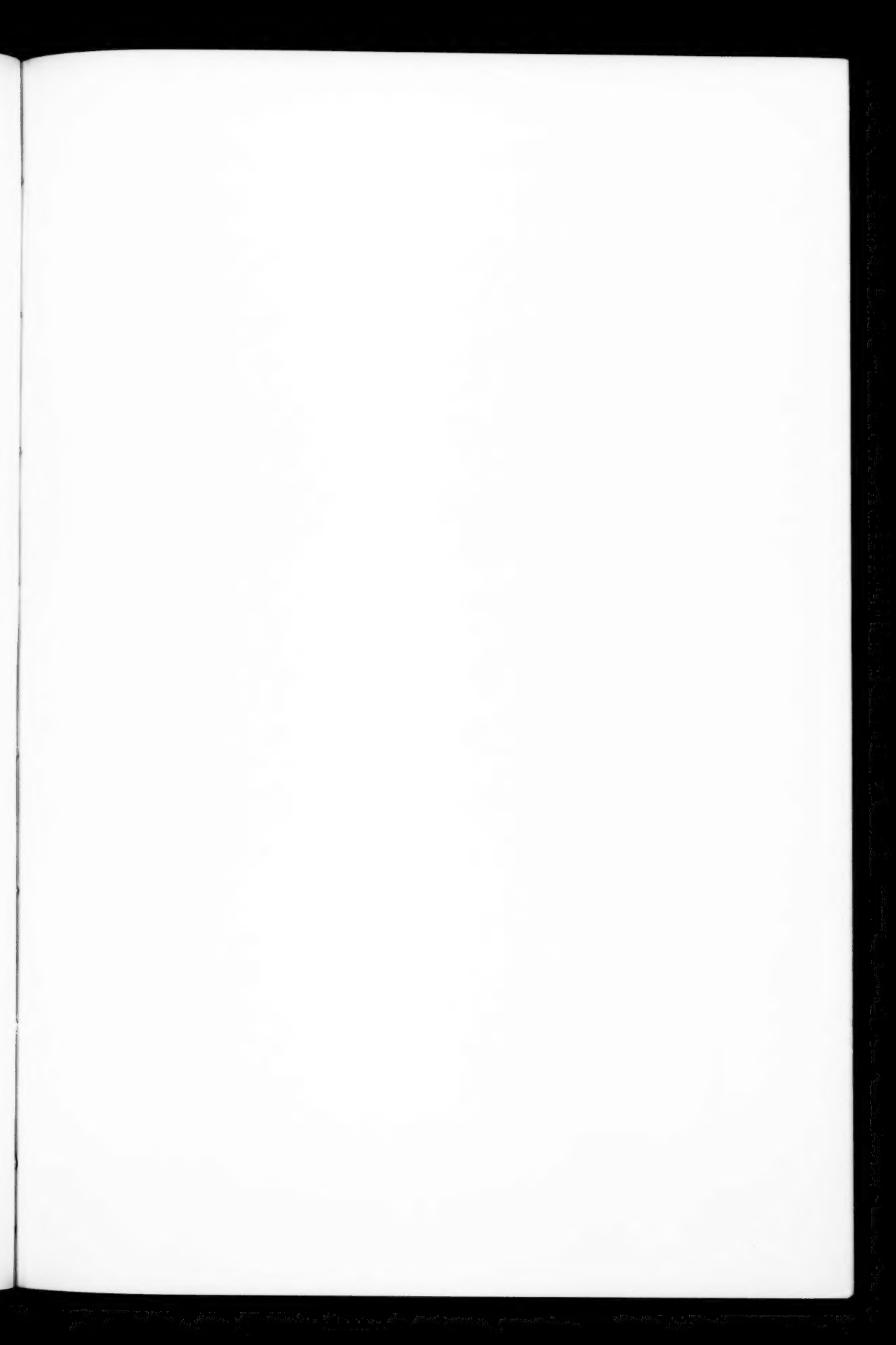


Fig. 11—Proliferative changes of small vessels with neoformation of capillaries and mitosis. Nissl stain, high power.





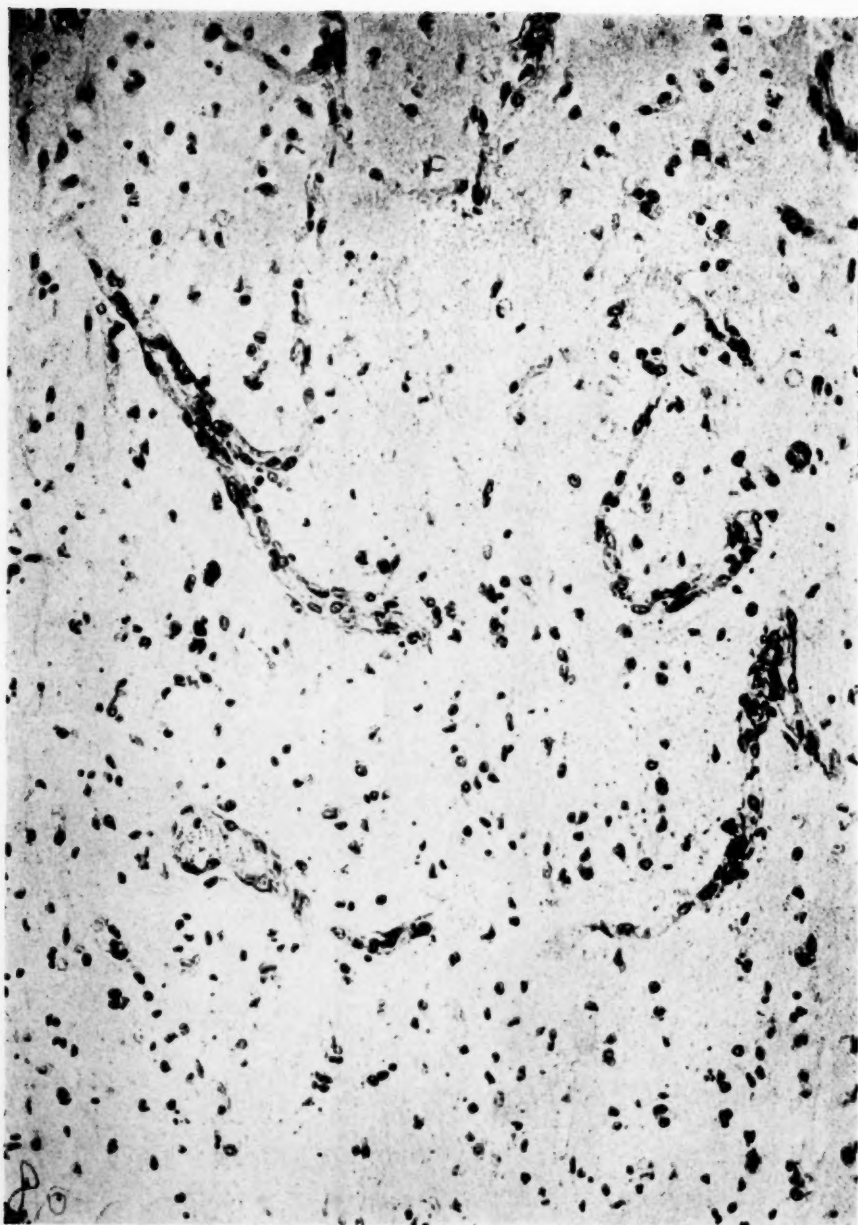
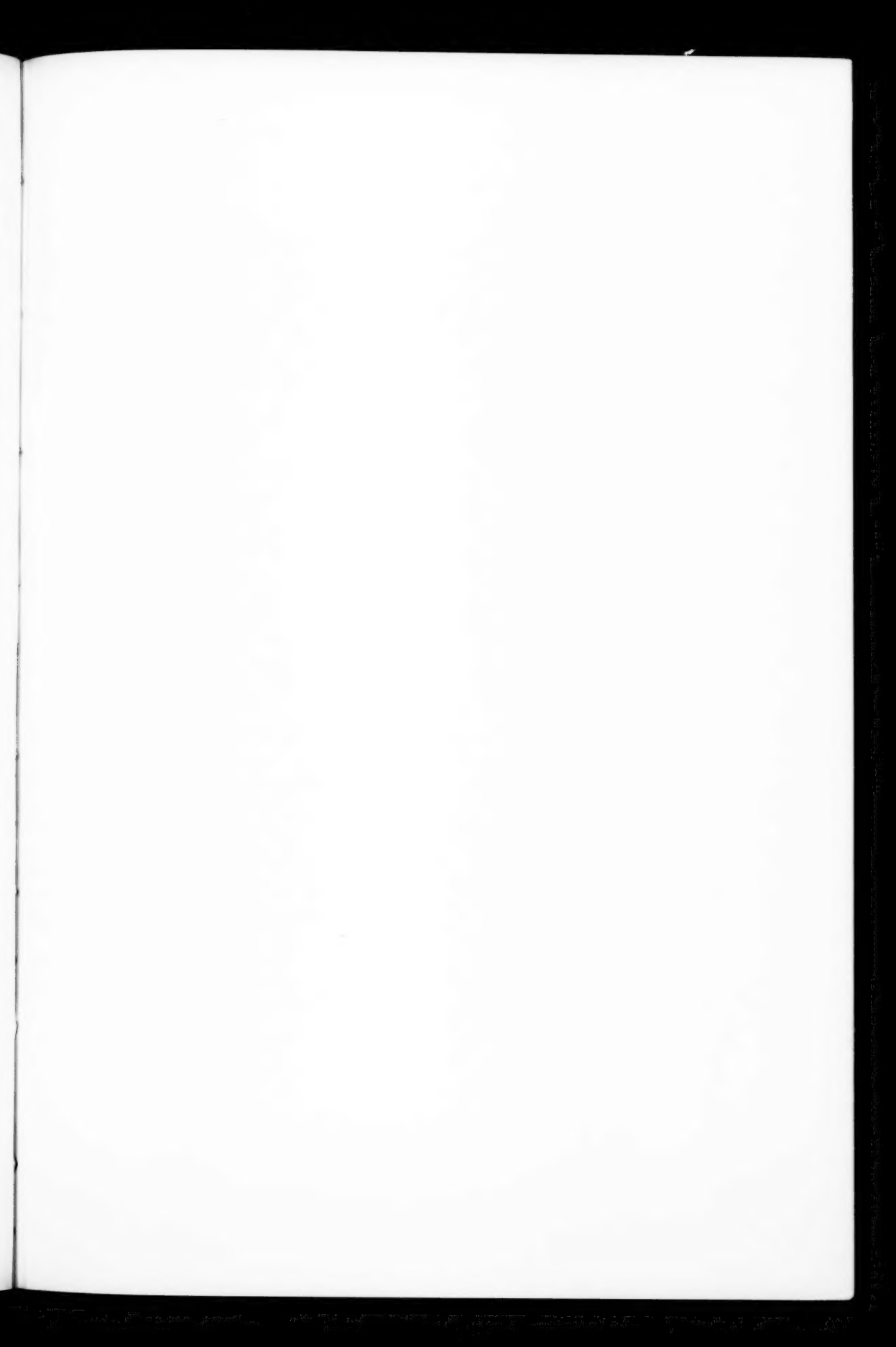


Fig. 10—Proliferative changes of small blood vessels. Nissl stain, medium power.



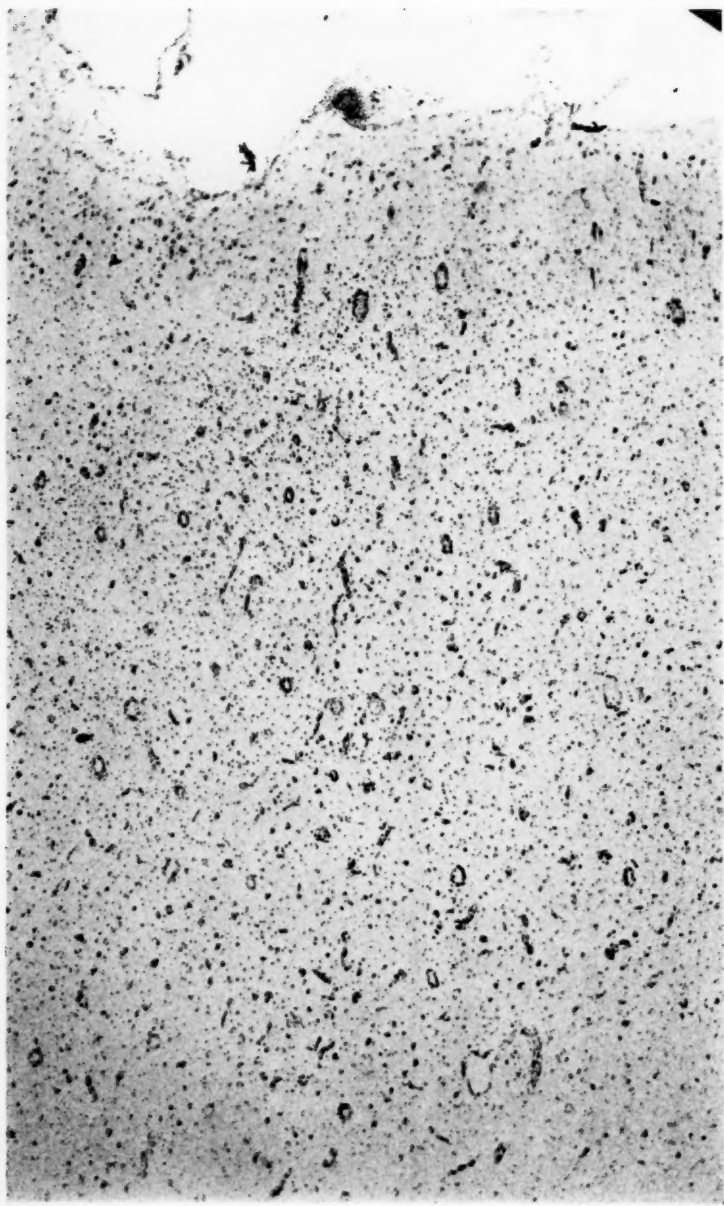


Fig. 9—Cortical area of vascular neoformation. Nissl stain, low power.

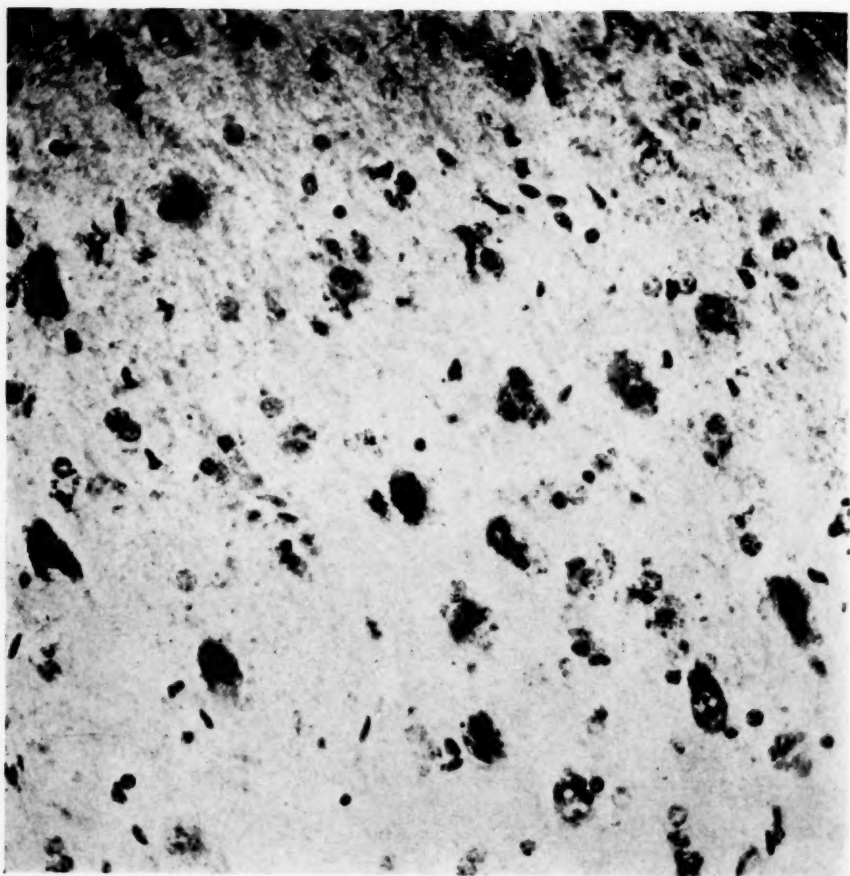


Fig. 8—Infiltration with fatty-like substance in the neuron cells. Herxheimer stain, medium power.

layer cells appeared filled with fatty material (Fig. 8). Small droplets of fat were also found in the perivascular spaces.

The myelin sheaths in the cortex when stained with Spielmeyer method occasionally showed degenerative changes in both radial and tangential fibers. The alterations were patchy in distribution and sharp demarcation was seen to occur often between normal and altered myelin tissue.

As already mentioned, proliferative changes of the neuroglia were present in the area of cortical cellular waste. The intensity of these changes varied a great deal from areas to areas. In addition, degenerative alterations of neuroglia such as ameboid changes and clasmatodendrosis were observed throughout the entire cortex.

The oligodendroglia, in Hortega preparations, showed the pathologic features of acute swelling throughout the entire brain cortex. Hypertrophic changes of microglia were observed in areas of major destruction of neuron cells. Rod cells were found in large numbers in these regions.

The cortical blood vessels showed striking changes. Sections were seen in which a large number of proliferated small vessels and capillaries occupied the whole width of the cortex (Fig. 9). These areas, in which the neuron cells had almost completely disappeared, extended occasionally in length to 1 cm.; usually, however, they were more limited. They were found scattered throughout the cortex but with more frequency in the temporal and occipital lobes. In other sections, proliferated blood vessels were present only in some layers of the cortex.

High-power examination of the proliferated vessels showed that the vascular walls were thicker than normal due to proliferation of cellular elements (Fig. 10). Both endothelial and adventitial cells appeared enlarged and well stained. The nuclei were swollen and well marked, and the granuli of chromatin were numerous and darkly stained. The cytoplasm was clearly visible, apparently succulent, at times vacuolated. Fatlike substance was occasionally seen in the cytoplasm of these cells. Numerous nuclei showed varying phases of mythosis. It was not infrequently that one observed pictures which could be interpreted as budding formation of new capillaries (Fig. 11). The proliferative changes of cellular walls resulted frequently in a narrowing of the vessel and eventually, in

obliteration of the lumen. Although the walls of larger vessels were occasionally thickened by a proliferation of adventitial and endothelial cells, the process appeared to involve especially capillaries and small blood vessels.

There was no perivascular infiltration; only occasionally a few cellular elements resembling gitter cells were scattered along the vessels.

2. *White matter:* The white matter of the brain appeared normal in myelin preparations. The vessels were diffusely congested and small extravasations of blood in the perivascular space could be observed frequently. However, in no place were these hemorrhages found to be so extensive as to cause apparent injury to the surrounding nervous tissue. The walls of the vessels only occasionally showed proliferative changes. Nuclei of glia cells not infrequently gathered in rows along the small vessels, outside the adventitial space.

3. *Basal nuclei and midbrain:* In the basal nuclei alterations of nerve cells similar to those in the cerebral cortex were observed. Areas of proliferation of blood vessels were present in the caudate nucleus, and to a lesser extent in the globus pallidus. The lesions were definitely patchy in distribution. Examination of the thalamus, the vegetative nuclei and of the midbrain showed lesions of the single nerve cells but no proliferative changes of the blood vessels, although occasionally progressive changes in endothelial cells of single capillaries could be detected.

4. *Cerebellum:* In the cerebellum, the Purkinje cells were deeply involved showing diffuse homogenizing alterations and dropping out of numerous cells. Slight increase in the number of Bergman glia cells was also observed. The vessels of the molecular layer appeared in some sections increased in number. Occasional increase of glia cells was also seen in the molecular layer but no branchlike network of proliferating glia could be detected. The nerve cells of the cerebellar nuclei showed marked alterations ranging from chromatolysis to vacuolization and colliquation. Similar lesions were seen in the inferior olive, whereas the cells of the nuclei of the pons and medulla were better preserved.

Case 2. D. A. (No. 306892),* a white male, aged 22 years, was admitted to Hudson River State Hospital on July 20, 1937, with the complaint of delusional trends.

The patient, born June 13, 1915, was the youngest of seven normal, healthy siblings. The father was living and well, the mother suffered from diabetes. There were two maternal uncles who had been patients in a State hospital for several years. Two other maternal uncles were said also to have been psychotic.

Birth and early development of the patient were normal. His prepsychotic personality showed apparently no abnormal traits. He graduated from grammar school. For the past five years prior to the admission, the patient drank periodically, at times becoming intoxicated.

The onset of the psychosis dated back about a year. At this time, it was noted that the patient was disinterested and restless. He showed marked tremors of hands and body. In June, 1937, he expressed fears of becoming a political victim, and complained that his friends were plotting against him. At the same time, he stated he had supernatural powers. He became so disturbed that on June 3, 1937, commitment to Mosher Memorial Hospital in Albany, N. Y., became necessary. During his residence there, he was described as quiet and seclusive, inattentive and detached. He presented ideas of power and influence. On July 20, 1937, he was transferred to Hudson River State Hospital.

On admission, the patient was quiet and cooperative. He was, however, seclusive, idle and obviously hallucinated. During the interviews, he showed some tendency toward preoccupation with his hallucinations. He answered questions readily, although sometimes injecting spontaneous, irrelevant statements. There was definite emotional poverty; although he feared for his safety, he made this statement in an indifferent manner. He admitted hallucinations in the auditory and visual fields and spoke of vague, bizarre somatic delusions.

During his residence in the hospital, there were no important changes in his condition. On September 7, 1937, insulin treatment was started with a 10-u. dose. With 65 u. perspiration and restlessness were observed. With 95 u. a strong reactivation of the psychosis occurred. Coma was obtained with 120 u. On Septem-

*Clinical observations by Dr. J. Notkin of the Hudson River State Hospital.

ber 18, following a dose of 120 u., the comatose state could not be interrupted by intravenous glucose, the pulse became rapid and the breathing stertorous. The blood sugar was 136 mgm. per cent. During the seven days following no important changes were noted, the coma persisted, resisting glucose therapy and the administration of adrenalin. The patient died September 27. The treatment had lasted 21 days. Ten injections were given, totaling 850 u. of insulin. There were three comas, the terminal coma lasting 10 days.

Postmortem examination was limited to the brain (No. 1811) which appeared normal at external inspection.

The meninges were microscopically normal; the meningeal blood vessels were markedly congested.

In Nissl preparations changes were found which appeared similar in character to those of Case 1. The cytoarchitecture of the cortex was, however, less markedly disturbed. Areas of cellular devastation involving the whole width of the gray matter were present in a very few sections, nor did they extend in length so much as in Case 1. Small roundish areas of cellular destruction were seen also occasionally. The most frequent alteration of the normal orderly lamination consisted of irregular dropping out of numerous neurons. The superficial layers were usually more altered than the deep ones.

All the types of alterations of single nerve cells which were found in Case 1 were also present in this case. However, shrinkage was less frequent and swelling of the cytoplasm and nucleus and chromatolysis predominated.

Fatty substances were found in the majority of pyramidal cells of the cortex. The neuroglia showed alterations which were predominantly degenerative in character.

Proliferative changes of the cortical capillaries and precapillaries were also present. In the larger vessels, the cellular elements had become markedly proliferated. The morphologic features of these vascular alterations were in every respect similar to those of Case 1. However, they were present in only a few sections and rarely in all parts of a section. It was not unusual to find a large number of small proliferated vessels within a circumscribed area while adjacent regions appeared normal in this respect.

Hemorrhages were not seen in this case but the vessels were markedly congested throughout the brain.

The white matter appeared normal. The Ammon's horn showed the same alteration which was found in Case 1. In the basal ganglia, thalamus and subthalamic nuclei, alterations of individual neuron cells were found that showed the same characteristics as those described in the cortex. In the cerebellum the Purkinje cells showed homogenizing changes but were better preserved in number in comparison with those of Case 1. There was no proliferation of Bergmann glia. In the white matter of the cerebellum rows of glia cells were observed frequently around the blood vessels.

Case 3. T. G. (No. 22151),* a white female, aged 33 years, was admitted to Utica State Hospital on October 18, 1935, with the chief complaints of confusion and paranoid trends. The family history was negative so far as nervous and mental diseases are concerned. The patient's early history was not remarkable, the first mental changes appearing in 1932. At that time she showed ideas of reference and delusions of persecution. In 1935, she was admitted to the Boston Psychopathic Hospital where hallucinations of the visual and auditory types were observed. In October, 1935, she was transferred to the Utica State Hospital.

On admission, she was quiet, disinterested and correctly oriented in all spheres. In her answers she was evasive and scattered. She readily admitted hallucinations in the visual and auditory fields. Little change in her mental status was observed the following two years.

On November 2, 1937, hypoglycemic treatment was instituted with an initial dose of 20 u. of insulin. Coma occurred during the seventh treatment with 70 u. The dose was gradually increased to 120. On November 29 the patient failed to regain consciousness following intravenous administration of glucose and adrenalin. Breathing was stertorous, tonic spasms of both arms were observed. At 5 p. m. of the same day, she suddenly collapsed and expired.

The total number of treatments was 16, the total dose of insulin being 1,240 u. with a maximum dose of 120 u. The duration of the treatment was 27 days. There were 10 comas, the terminal coma lasting seven hours.

*Clinical observations by Dr. O. J. McKendree of Utica State Hospital.

Postmortem examination was performed 16 hours after death. No significant gross findings were noted.

The brain (No. 1833) showed no macroscopic alterations.

On microscopic examination, diffuse cellular alterations were found which showed the same variety as in the previous case. Vacuolization of the cytoplasm and colliquation of the cells were frequent. Numerous cells were also seen exhibiting the features of the ischemic change of Spielmeyer. Occasionally, cells were observed which corresponded to the descriptions given by Gildea and Cobb of "spikey cells." Dropping out of neuron cells, chiefly of the superficial layers, was as frequent as in Case 2. Areas of devastation involving the whole cortex were not seen whereas circumscribed areas of cellular waste were more frequent than in Cases 1 and 2. These areas were sharply defined, the neuron cells had disappeared completely as well as the interstitial cells. The blood vessels were markedly congested throughout but no hemorrhages were observed. In single small vessels of the cortex, endothelial and adventitial cells had proliferated. Mitosis was not observed. Swelling of the cytoplasm of endothelial cells was a common feature. In general, the capillaries were much in evidence throughout the brain, being engorged with blood and showing unusually well-stained endothelial cells. However, neoformation of blood vessels, which was a striking feature of Case 1, was not observed.

Small amounts of fatty substances were found within the pyramidal cells in Herxheimer preparations.

The myelin sheaths of the cortex showed diffuse lesions similar to those of Case 1, though much less severe. Another type of lesion consisted of sharply demarcated areas of destruction of myelin sheaths which likely correspond to circumscribed areas of cellular devastation seen in Nissl's preparation.

The Sommer sector of the Ammon's horn showed characteristic cellular waste, identical to that of the two preceding cases. There, fatty changes were also quite pronounced in this case. The cerebellum was normal except for homogenization of the Purkinje cells. The cerebellar nuclei showed marked vascular congestion and there appeared to be some proliferative changes of the endothelium.

Case 4. (No. 25518),* a white female, aged 44 years, was admitted to Central Islip State Hospital on April 5, 1935 with the chief complaints of confusion and excitement. No information was available concerning the family history. The personal history failed to show any significant data until 1935. At this time, the patient complained of hearing voices accusing her of obscene behavior. When friends tried to dissuade her from expressing such ideas, she became so greatly excited that she required commitment to Bellevue Hospital, New York City, where she appeared excited and noisy. A few days later, she was transferred to Central Islip State Hospital. Hallucinations of a derogatory nature and delusions of reference persisted. The mood was unstable. Orientation and memory were good. The patient adjusted well to the hospital routine and improved steadily. In June, 1935, she was paroled to friends.

In October, 1937, the patient was readmitted, ideas of persecution having recurred. On examination, she showed a great number of paranoid delusional trends involving ideas of reference and of physical control.

On January 27, 1938, hypoglycemic treatment was instituted with an initial dose of 20 u. of insulin. Coma occurred at the third treatment with a dose of 50 u.

On February 2, in the course of the third coma, the patient failed to respond to the usual procedure for terminating the hypoglycemic state. The comatose condition persisted unchanged during 11 days. High temperature, symptoms of circulatory collapse and occasional muscular spasms were observed during this period. Repeated determinations of glucose in the blood and spinal fluid showed values above normal and glucose was constantly found in the urine. Administration of glucose, adrenalin and vitamin B was without effect on the coma. The patient died February 13, following extreme elevation of temperature and signs of cardiac decompensation.

The total number of treatments was five, the total dose of insulin being 205 u., with a maximum dose of 50. The duration of treatment was 17 days. There were three comas, the terminal coma lasting 11 days.

Postmortem examination was performed 40 hours after death. Gross examination of the organs failed to show any important

*Clinical observations by Dr. F. J. O'Neill of Central Islip State Hospital.

changes. The brain (No. 1832) weighed 1,110 gm. No gross lesions were noted. Microscopically, study of the ganglion cells revealed that paling and homogeneity of the cytoplasm due to chromatolysis and swelling of the cellular body and nucleus were the prominent types of lesions. Satellitosis and neurophagia were more frequent than in Cases 2 and 3. Ischemic changes were rarer than in the other cases.

Cytoarchitectural alterations were less marked in this case. The type more frequently met with was a diffuse decrease of the number of neuron cells throughout the cortical fields when compared with sections of normal brains. Complete cellular devastation of cortical areas was not seen nor were circumscribed areas of cellular waste as frequent as in the other cases. In addition, fatty change of nerve cells was found evenly distributed.

The Ammon's horn showed the characteristic lesion of the Sommer sector as described in Case 1. The gray matter of the basal nuclei, thalamus and hypothalamus was less involved than the cortex. The white matter appeared normal throughout. No proliferative changes nor neoformation of vessels could be observed. However, in several sections, the small vessels stood out more clearly than usual in Nissl preparation due to a swelling of the lining cells. The nucleus of these swollen cells appeared enlarged and the chromatin deeply stained. This alteration was found only in the cerebral cortex, and its distribution was irregular. Signs of inflammation were entirely lacking.

COMMENT

A. Changes of the nerve cells should be first stressed. These alterations, as seen in Nissl specimen, may be grouped under four headings:

1. *Areas of cortical devastation.* This type of lesion consisted of an almost total loss of nerve cells throughout the entire cortex. There was no shrinkage of the tissue, the glia showed at times marked hyperplasia, at other times no glia reaction was present. The blood vessels were usually, but not always, proliferated. These areas were present only in Case 1.

2. *Diffuse "dropping out" of neurons.* The neuron cells as compared with homologous sections of normal brains appeared dif-

fusely reduced in number, the reduction including the six laminae or more frequently only the superficial layers. Occasionally, the dropping out was limited chiefly to the third or fifth layer. The glia showed usually mild diffuse proliferation. This type of alteration was found to be very marked in Case 1, moderate in Cases 2 and 4, and slight in Case 3.

3. *Focal areas of cellular waste.* This type of lesion appeared at low power as a more or less sharply defined area of discoloration. The majority of nerve cells within the areas were lost, the few remaining showed severe changes, usually of the ischemic-homogenous type. Occasionally, minute vacuole spaces were present in the interstitial tissue. In a few instances a small blood vessel was seen within the smallest lesion. Sharply defined areas were seen in Case 3; in Case 1 they were also numerous but usually ill defined. Cases 2 and 4 showed this type of lesion only occasionally. Under this same heading, a type of lesion may be included consisting of patchy dropping out of neuron cells which was limited to the Sommer sector of the Ammon's horn. This characteristic feature was present in all cases.

4. *Lesions of individual neurons.* These may be grouped as follows:

(a) Disintegration of the Nissl bodies which resulted in a pale, uniform, diffuse staining of the cytoplasm. This lesion was extremely common in all the cases, only a few cells showing normal basophile substances.

(b) Swelling of the cytoplasm with displacement of the nucleus to the periphery and paleness and homogenous appearance of the cytoplasm. It was frequently seen in Cases 1 and 2, less in Cases 3 and 4.

(c) "Severe cell change" of Nissl consisting of colliquation of the nerve cell. It was present in Cases 1 and 3.

(d) So-called "chronic cell disease" consisting of shrinking and distortion of the cell body which stained darker than normal, displacement and pyknosis of the nucleus. This lesion was observed in many sections throughout the four cases.

(e) "Ischemic change" in which the cell contour was sharply defined and triangular in outline, the cytoplasm pale, homogenous

and strongly eosinophile, the nucleus displaced and dark in color, was also frequently found. Cases 1 and 3 showed this type of lesion more frequently than the other cases.

(f) Fatty degeneration. This alteration was marked in Cases 1, 2 and 4.

B. Alteration of the blood vessels. In Cases 1 and 2 the vascular alterations consisted of marked proliferative changes of the endothelial and adventitial cells of small blood vessels and capillaries and rich vascular neoformation. In other sections, swelling of the intimal cells of the vessel walls was a prominent feature. The latter finding was frequently observed in Cases 3 and 4. It is likely that swelling and proliferation represent two successive stages of the same pathologic process.

The interpretation of the histopathological findings in our cases offers considerable difficulty. That the schizophrenic process itself may be held responsible for the neurocellular pathology might be excluded. Although degenerative changes of individual nerve cells and acellular areas have been repeatedly described in schizophrenia (Josephy,³⁴ Miskolczy,³⁵ Klarfeld,³⁶ Naito,³⁷ Fünfgeld³⁸), their occurrence is not constant and their significance doubtful (Peters,³⁹ Scholz⁴⁰). Moreover, lesions so marked as those found in Case 1 have never been described in schizophrenia.

Postmortem changes undoubtedly may account for some features of single nerve cells. However, extensive dropping out of neurons, severe cellular colliquation and ischemic alterations coexisting with ameboid glia changes, are undoubtedly antemortem lesions. It will be noted, furthermore, that in Case 1 where the autopsy was performed three hours after death more severe cellular changes were found than in Case 4, in which postmortem examination followed 40 hours after death.

There remains the distinct possibility that the protracted coma which preceded death in Cases 1, 2 and 4, might be responsible for lesions of the neuron cells. To be sure, one hesitates to ascribe too much significance to diffuse cellular changes in brains that withstood the severe biochemical changes occurring in comas of very long duration. However, in Case 3, in which the final coma lasted only seven hours, striking cellular changes were found. Moreover,

similar lesions were observed in Cammermeyer's³⁰ case in which no prolonged coma occurred.

Therefore, there seems to be enough evidence for the assumption that the neuron cells are more or less damaged during life, in schizophrenic patients treated with insulin. This statement appears in agreement with the findings of numerous other investigators in both therapeutic and spontaneous hyperinsulinism (Morsier,²⁶ Lep-pien and Peters,²⁷ Kobler,²⁸ Kastein,²⁹ Wohlwill,¹⁰ Bodechtel,¹² Vonderahe,²² Terbrüggen,²¹ Moersch,²³ Malamud²⁵).

That insulin or some substances elaborated in hyperinsulinism might have a direct damaging action upon the neuron cell, as maintained by Kobler²⁸ and Malamud,²⁵ cannot be excluded on the basis of our preparations. Bearing in mind that insulin lowers the glycogen content of the brain (Kerr and Ghantus⁴¹) and that Nissl bodies contain a glycogenlike substance (Szent-Gyorgi⁴²), one may speculate on a specific action of insulin upon this essential component of the nerve cell. As a matter of fact, disintegration of Nissl bodies was universal in all four cases.

It seems interesting also to note the increase in our cases of intracellular lipoid substance. This finding is also reported by Kobler²⁸ and Kastein²⁹ in their patients, and by Terbrüggen²¹ in spontaneous hyperinsulinism. This fatty infiltration may represent a nonspecific reaction to a toxic condition. However, there is some evidence that it might be the result of a specific action of insulin upon the intracellular metabolism of lipoids since it has been claimed that under the action of insulin, sugar may give origin to fatty substances (Rivoire,⁴³ Staub,⁴⁴ Asher⁴⁵).

Further indication of a direct damaging action of insulin on neuron cells may be offered by experimental findings suggesting that insulin diminishes intracellular oxidation in the brain (Holmes,⁴⁶ Wortis⁴⁷). Altogether, however, the assumption of a primary toxic degenerative mechanism upon neuron cells is supported by evidence derived more from biochemical considerations than from histologic findings.

To be sure, the study of our histologic preparations strongly suggests that an additional mechanism plays a role in the causation of the cellular damage. Such a suggestion derives from the findings in our cases of areas of cellular rarefaction, cellular wast-

ing of the lamina pyramidalis of the Ammon's horn and ischemic cellular changes. These lesions are similar in nature to those encountered in several other pathological conditions—in epilepsy (Spielmeyer,⁴⁸ Scholz⁴⁹), in eclampsia and eclamptic pseudouremia (Wohllwill,⁵⁰ Braunnmühl,⁵¹ Benoit,⁵² Bodechtel⁵³); in pertussis “encephalitis” (Husler and Spatz⁵⁴); in fat or air embolism (Neubürger,⁵⁵ Weimann,⁵⁶ Bock⁵⁷); in occlusion of the carotids (Müller⁵⁸); in arteriosclerosis (Neubürger,⁵⁹ Brinkmann⁶⁰). The similarity of the pathologic picture in such a variety of conditions is referred by Spielmeyer⁶¹ and his school to a common pathogenic mechanism, vascular in character. This mechanism is not necessarily evidenced by morphologic changes. In fact, many reports in the literature seem to uphold Ricker's⁶² and Spielmeyer's⁶¹ conception that in order to produce lesions in the central nervous system, vascular changes of a functional nature such as vasospasms or vasopareses might be sufficient. That a functional vascular element may play a role in determining some of the pathological findings in hypoglycemia is also evidenced by the frequent occurrence of certain symptoms such as transitory aphasia, transitory hemiplegia and convulsive seizure, which are commonly explained on the basis of transitory functional disturbances of the brain vessels (Wilder,⁶³ Labbé,⁶⁴ Palisa⁶⁵).

Moreover, that a vascular mechanism, expressed in terms of morphological changes, played, in our cases, an important role in the causation of the neuron cell lesions, is supported by direct evidence based on actual histological alterations of the blood vessels. The pathologic picture of the blood vessels which we have described in our cases bears striking similarities to the so-called “productive type” of vascular reaction described in lead intoxication by Bonfiglio⁶⁶ and Hassin⁶⁷ and in malaria by Cerletti.⁶⁸ More recently Winkelman and Eckel⁶⁹ described similar lesions in the brains of patients who died following severe infections and toxemias. Our cases, as well as that reported by Kastein²⁹ bear witness to the frequency of these alterations in insulin intoxication. It will be noted also that in Moersch and Kernohan's²³ case of spontaneous hyperinsulinism, a few cortical areas of proliferating vessels were observed. Likewise, in experimental intoxication with

insulin, in dogs and rabbits, Dünner,⁴ and Accornero⁵ reported proliferation of the vascular endothelium and neoformation of capillaries of the brain.

It is reasonable to assume that the reduction in size of the lumen of the blood vessel resulting from proliferative changes of the endothelium will lead to a decrease in the amount of oxygen conveyed to the nerve cells. Functional disturbances and productive changes may be regarded as two recessive phases of the same process, in accordance with the view of Spielmeyer⁷⁰ and Braunmühl.⁵¹ Altogether, the association of functional and anatomic changes of the blood vessels will result in anoxia of the nerve cells.

In the light of these pathologic findings, the mechanism of prolonged coma can be brought into clearer view. With the increasing application of Sakel's method, it has become apparent that prolonged stuporous conditions may develop in schizophrenic patients undergoing insulin shock treatment. That hypoglycemia is not responsible for the stuporous conditions is evidenced by the high value of blood sugar in such a state (Cases 2, 3, 4 and the cases of Leppien,²⁷ Kobler,²⁸ Kastein²⁹). As a matter of fact, repeated injections of glucose fail to revive the patients. In these instances, it is reasonable to assume that contrary to what may happen in recoverable cases, irreversible changes have occurred as the result of chemical and vascular mechanisms. The vascular mechanisms in these instances are presumably not functional transitory ones, but result from extensive morphologic changes leading to endarteritis.

It seems proper, in conclusion, to correlate the recoverable comas which occur in the initial phases of insulin treatment with pathologic changes of a reversible nature amenable to glucose therapy. In more advanced phases of the therapy, destruction of nerve cells is likely to take place leading eventually, in fatal cases, to considerable destruction of nerve tissue. These irreversible lesions are brought about by vascular mechanisms. To be sure, other factors chemical in nature are presumably instrumental in causing prolonged coma and death. The elucidation of these factors, however, is outside the domain of neuropathology.

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SOME ASPECTS OF HOMOSEXUALITY IN RELATION TO TOTAL PERSONALITY DEVELOPMENT*

BY DONALD M. HAMILTON, M. D.

Down through the ages man has been concerned with homosexuality. Some of the most ancient historical documents, dating back several thousand years before Christ, make definite statements concerning homosexuality, indicating that this form of sexual instinct expression was already long established. In ancient Egyptian papyri the gods Horus and Set are described as homosexual deities and worshiped as such. A well-known extract from Plato describes his seduction of Socrates. It is common knowledge, of course, that the Golden Age of Greece was associated with a social acceptance of homosexuality and it is said that the derivation of the word pedagogue is from a Greek word signifying the slave attendant on Greek youths of wealth whose considerable duty it was to guard their charges from the seductive efforts of Athenian noblemen. The anthropologist has provided us with information indicating the universality of homosexuality in primitive races now existing on earth.

It is interesting to examine the attitudes of peoples at various eras toward this problem. From the Old Testament book of Leviticus we take the following quotation: "If a man also lieth down with mankind as he lieth with a woman, both of them have committed an abomination. They shall surely be put to death. Their blood shall be upon them." The "sexual abomination" of Sodom and Gomorrah is biblically punished by fire from heaven and this myth creeps into our language with the word sodomy. It is difficult to see much difference between the attitude indicated above and that commonly accepted in our times in the western world.

The above quotation is markedly in contrast with the following one from Plato, a homosexual himself: "It is very unjust that the homosexual should be accused of immodesty for it is not through lack of modesty that they act this way; it is because they have a strong soul, manly courage and a virile character that they seek their own kind and this is proved by the fact that with age they seem to be more efficient than the others as servants of the state.

*From the clinical service of the New York Hospital, Westchester Division, White Plains.

When they in turn become men, they seek young men and if they marry, if they have children, it is not because nature urges them to do so but because the law forces them to do so. What they like is to spend their lives with each other in celibacy." The attitude that homosexuality enhanced virility was accepted in later Roman times when soldiers were discouraged from female companionship and endeavors made to increase recreational contacts between the soldiers themselves even to the point of encouraging homosexuality. The charms of women were viewed as enervating and leading to weakness of character, softness of will, traits which, if present, of course, would be hardly compatible with the hard life of the soldier of that time.

In the middle ages homosexuality among the Knights Templar was so commonly known to be present that this afforded the basis for a famous scandal. In the Renaissance we find Leonardo da Vinci being brought to trial on accusation of homosexuality and following this living an eccentric life of distrust toward his fellow-men, which may well have been the basis for the dissipation of his genius in uncompleted projects. Michaelangelo, Shakespeare and Marlowe were reported to have been homosexual; they certainly have left us brilliant examples of their genius in which homosexuality is suggested strongly. In modern times the emotional attitude of abhorrence to homosexuality is so strong and so generally accepted that it probably determines the present plainness of masculine attire and the evident embarrassment between long-parted male friends whose affective demonstration must not go beyond vigorous handshakes and pounds on the back—lest suspicion be cast upon them.

Throughout history we thus see evidence of this form of sexual expression. So universal a finding suggests that some attribute attendant upon homosexuality may be inherent in man in general. Embryological research supports this view. We are all familiar with the delay in sex differentiation of the developing embryo when for a definite interval both male and female sexual parts coexist equally developed. However, the development of one of these in the ordinary course of events is, of course, destined to cease and remain vestigial or altered in its function, in keeping with the singleness of adult sexual functioning. Rare anomalies

of sex differentiation, pseudo and true hermaphroditism, have long been recognized as examples of the relative or absolute interference with this process. The common embryological origin and the gross anatomical similarity between the clitoris and penis, the ovary and testicle, the uterus and the prostatic utricle immediately impress the first-year medical student. The physical basis for the bisexuality of man is evident and generally accepted. However, in connection with the homosexuality this does not conclude our interest in the subject so far as the etiology is concerned. We are all familiar with the quotation that heredity determines what one can do; environment determines what one does do. The latter part of the quotation brings to us the need for explaining the psychogenic basis for bisexuality in man.

Freud and Ferenczi have shown clearly the influence of the early environment on the adult personality organization in general. This applies likewise to the adult sexual characteristics which are but partial manifestations of the whole. In other words, there is a clear-cut tendency existing in man for an intimate association between his attitude, interests, mannerisms, and so forth, and the degree of psychosexual maturity.

The depth and kind of emotional bond between the child and each of his parents, which is obviously related to the conditioning experiences between the child and the parents, tends to play a large determining part in the development of the personality.

A firm love relationship between any two individuals results in what we call a psychological identification of the one with the other. That this can influence personality in specific circumstances is commonly accepted. The child tends to imitate the attitudes, interests and mannerisms of those he strongly loves. Negative emotional relationships, involving hatred, fear and resentment, promote the development of opposite characteristics to the one toward whom he feels so strongly. In male homosexuals we find this point clearly illustrated. It is common to find that in childhood there is an exaggerated strong identification with the mother, largely determined as often by environmental reasons as by constitutional ones. Identification with the father is poorly developed either from choice or from fear, and also in relation to constitutional and conditioned factors.

Such individuals generally look at themselves unconsciously as women and frequently are aware of this consciously. Identification with the mother results in varying degrees of imitation of feminine attitudes, interests and mannerisms. Fear of the father frequently determines a passivity of character which would not otherwise be present to such a degree, as an expression of the determination to attract the least possible hostile reactions from the father. In women we may find the opposite situation. Strong identification with the father may result in determining masculine traits, to such an exaggerated degree that some masculine women seem to be more masculine than any man. Negative emotional reactions (fear, hatred, resentment) toward the mother may color the whole relationship with the female sex in such women, just as in the illustration above the relationship of the male with members of his sex is also interfered with. The expression of this character formation in sexual activity is in keeping with these psychological determinants and must not be given undue importance so that the nonsexual characteristics are neglected.

Adolescence is well known to be associated with "crushes" between members of the same sex, often leading to homosexual activity. This age period is frequently spoken of as the homosexual stage of personality development. We recognize it not as abnormal for an individual to pass through this age with some conflict. However, ordinarily he alters the course of his love to a heterosexual direction at least by the early twenties and thus resolves his conflicts.

In changing from a homosexual personality structure to a heterosexual one, the love object frequently is someone of the opposite sex who is older than the individual, frequently a friend of the parents or a teacher. Examples of this are not unusual in the way of "crushes," but sexual intimacies are often associated also. The final interest in someone of the opposite sex of about the same age is the final step and is associated with a further maturity of personality, illustrated by independence from the family and aggressive handling of life through personal evaluation of factors involved and judging therefrom.

This gradual evolution of the personality and the sexual instincts involved is the usual process. We must continually remind

ourselves of this process of development and change and not look at the sexuality of an individual, or any other single attribute, as a static thing, particularly when we are dealing with adolescents and young adults.

In the highly civilized environment in which we live we must remember that psychological adolescence is prolonged frequently years beyond physiological adolescence because of the longer period of economic dependence on the parents which delays the emancipation from them and retards personality development. The number of individuals in our schools of advanced education is increasing and this results in the greater frequency of emancipating conflicts among these students.

There are those who view all mental illnesses whose basic conflicts center upon homosexuality as having a bad prognosis. We are all familiar with those with homosexual conflicts so strong and deep-seated that splitting of the personality results with the development of paranoid dementia præcox. This by no means is the usual outcome of all such personality conflicts. There are statistics indicating that about 50 per cent of successfully married men and 25 per cent of successfully married women have had overt homosexual experiences in adolescence. Among our patients we see individuals with mental illnesses in the late adolescent or early adult age periods whose basic conflicts largely involve the stresses associated with their delayed development beyond the homosexual stage. Many of these patients do extremely well and live on to maturity psychologically and instinctively and lead happy, married lives, contributing materially to society.

Homosexual conflicts are not only present among schizophrenics but color manic-depressive and involutional psychoses and those psychoneuroses in which panic states and paranoid projection mechanisms are displayed, as symptoms of this conflict. Part of our duty as psychiatrists is to deal with this conflict and, by education, help the patient, if possible, to make a better adjustment through understanding and appreciation of the facts involved.

Prepsychotic personality traits in our patients which are the result of conflicts associated with a homosexual stage of development are not necessarily static ones. These frequently can be modified, particularly in younger patients, and related to the environment in

a socially acceptable manner so that the individual's conflict is lessened with the result that he is better protected from future mental illness.

Education of the patient relative to the facts concerning personality development with emphasis placed on the correlation between physical and emotional factors will aid him in guiding himself through life in the future, and will lead to discussions which will tend to desensitize him to whatever sexual conflicts he may have. An understanding of his own personality assets and liabilities, deriving from constitution or from conditioning factors, may help him to develop the former and deal more efficiently with the latter.

In handling a patient with such difficulties it is necessary for the psychiatrist to evaluate the relative importance of the conditioned and constitutionally derived homosexual elements. This will lead to an understanding of the relative degree of the fixation. Where both factors are of marked importance and the fixation deeply laid, we shall, perhaps, be faced with the problem largely of helping the patient to sublimate his homosexuality to the greatest possible degree. This may be accomplished in various artistic pursuits or in organizations in which he can be with his own sex, and yet where his efforts may have acceptable and even positive value to society as a whole. Such organizations as the various fraternal lodges, the Boy Scouts, Y. M. C. A. and the National Guard are suggested.

If conditioning influences are of more obvious importance in the situation, the patient young and thus the fixation not deep, we may help him develop his character beyond the level of the homosexual stage to the adult heterosexual one. Here, of course, is the ideal therapeutic situation. Careful psychiatric guidance can result in the development of habit patterns which are of a mature sort. Individuals developed along passive lines can be aided in expression of their repressed aggressiveness by becoming interested in sports where force is used, such as baseball, golf and tennis. Hobbies and a program initiated to promote social contacts with both sexes will aid the individual in developing confidence in himself and help him to lose restraint in his actions. The relationship with a physician of his own sex who is sympathetic and understanding will help substitute a more acceptable parent figure for the one the patient already has in his concepts. This relationship is of great therapeutic value.

We recognize that all such patients are not passive, women frequently being overly aggressive and certain men reacting to their problem by an overcompensatory aggressive rebellion against authority. Of course such patients have to be guided along different channels in keeping with their organization.

Homosexual conflicts, in their fullest meaning, are practically universal in adolescent and early adult psychoses and should, therefore, be looked for carefully and taken into consideration in the treatment. We must recognize, of course, that treatment procedures as outlined above and as illustrated in the case reports are not applicable to all cases with homosexual conflicts. Such an approach could do great harm to an early schizophrenic and should be used only by those with psychiatric training and experience. Such an approach presupposes an already rather adequately developed ego in our patients.

The following three cases are illustrative of this sort of psychiatric problem and are not uncommonly met with.

D. G., a 20-year-old, single, college student was referred to the hospital because of a depressed state of several weeks duration which had culminated in an unsuccessful suicidal attempt, shortly before admission on February 20, 1937.

The family history disclosed that the Scotch paternal stock was composed of many individuals who were reserved and emotionally cold. The father, a moderately successful commercial photographer, was undemonstrative, reserved and self-contained. The Scotch maternal stock contained many individuals who were easy-going, unambitious and reserved. The mother, an immature personality, was suspicious and critical of others and so led a seclusive life entirely centered around her three sons. The oldest sibling of the patient was married; he was reserved, lacked ambition and was passively following his father's footsteps in the photographic profession. Another brother, 29, was ambitious and had compensated well for his passive nature. He was successful as a physician in a small town. In his last year at college this brother suffered a "nervous breakdown" which did not necessitate hospitalization.

The patient was born in a small New York State town, the last of three children, nine years separating him from his next oldest brother. His mother, desiring a girl after having two sons, al-

ready had decided to call her child Dorothy before "her" delivery. It was a great disappointment to her when the patient arrived. She attempted to compensate by naming the child Donald, the closest masculine equivalent to Dorothy she could imagine, and proceeded to bring her youngest son up as a girl. He was kept in dresses and long curls until the age of 4 and was encouraged in feminine interests, i. e., sewing, dolls, et cetera. At the age of 11 he was still playing with dolls. A generally passive, gentle individual from birth, the patient easily fell a victim to his mother's whims. Physically as a child he was fair-skinned and grossly obese. Because of this and his effeminacy he was teased viciously by his playmates. He reacted to this in a passive manner, backing down in every fight, and through childhood was effeminate in mannerisms and attitudes.

As the youngest child, with siblings 9 and 11 years older, respectively, he was spoiled by the entire family. Early he made a hero of his next older brother. This brother went to college, where he was outstanding in his studies and extracurricular activities in sports, and as football manager. He feared his undemonstrative father, who was responsible for the discipline in the family.

With puberty, between the ages of 14 and 15, the patient showed a marked physical and personality change. Within this year he grew several inches, lost 20 to 30 pounds in weight, and no longer displayed the exaggerated shyness of his childhood. He mixed more freely and took part in extracurricular activities and social functions at high school. However, he remained somewhat sluggish physically, was overparticular in choosing his friends and lagged behind the other boys in his interest in the opposite sex.

His psychosexual history disclosed the following facts: He indulged in mutual exhibition of sexual parts with a girl his own age at five years. At seven or eight he hid in the bushes at the swimming pool so that he could see the genitals of the men. At 15 he started to masturbate, with vivid phantasies of a homosexual nature involving mutual masturbating and fellatio. In these phantasies he thought of himself in a passive role being seduced by older men, frequently choosing movie actors in his phantasies as the seducers. At 16 the patient induced another boy his own age into mutual masturbation and this experience was repeated over a period of several months until finally the patient's guilt feelings led to

repression. Between 14 and 16 he masturbated once daily and the next year reduced this to about once monthly. At 18 he entered college and, believing he should put aside this habit, tried to stop it and indulged only occasionally when home during vacation.

At college he joined the fraternity to which his brother had belonged, excelled in his studies and immediately tried to emulate his brother by trying out for football manager and attempting to interest himself in sports. He was uncomfortable in the masculine environment of his college and immediately noted the difference between his interests and those of his fellow-students. He disliked active, rough-house sports; he felt no desire to have dates and did so only to keep up with the other boys. Through pressure from his fraternity brothers he continued in his efforts to become football manager but felt inferior in what he felt was the "rough, coarse environment." His greater interest in college publications was subordinated to football interest and finally given up. He attempted to mingle freely with the athletes at school but felt inferior and overwhelmed by their easy, assured aggressive manner and actually was friendly with but a small group in his fraternity who had largely intellectual interests like himself. He was uncomfortable and defensive with another clique in his fraternity, a group of engineering students who affected crude manners, carelessness of dress and an outdoor, "he-man" personality. A third group of individuals he also resented. This group, which he called the "boy scouts," idealized college life in the usual fashion and put pressure on the others to become outstanding personalities on the college campus for the good name of the fraternity. He formed a close attachment to his roommate, an entirely different personality to his own. This boy the patient described as a "scintillating athlete and a wild man with his liquor and women." The patient soon recognized the sexual aspect of this attachment and struggled with his consciously recognized homosexual impulses. These he feared, if expressed, would ruin his college career. In spite of his inner conflicts he did well in his studies and at the end of his second year was chosen one of the two assistant managers of football, a coveted honor.

On his return home during the summer after his second year he was critical of his parents, who lacked his intellectual interests. He

criticized their lack of knowledge concerning the finer points of the social amenities. His criticism was directed chiefly toward his mother and he continued reserved with his father, as he always had been. He missed the social activities of college and was bored by the small-town life at home.

On his return to college he soon found himself involved in fraternity dissension among the three cliques and the patient's group shortly discovered that a coalition had been made against them. Their dilettante attitude was criticized by the others and the four youths making up the patient's group all became mildly depressed. As a result they were even more close in their personal relationships. This only stimulated the patient's sexual conflicts and he gradually became more depressed. During the Christmas holidays before admission he was discouraged and spoke to his parents of giving up school. He returned to college but continued depressed, found concentration difficult and felt increasingly insecure. Finally on the night of a dance in mid-February, 1937, when he felt unable to have a date, he went to his room and took five sleeping powders with suicidal intent. He was found unconscious at breakfast time the next morning, was aroused and confessed what he had done and his physician brother was notified. Psychiatric consultation was arranged for and hospitalization was advised. He was admitted here February 20, 1937.

Physical status: T., P., R. normal. Height 5'9"; weight 147 pounds. A blonde, round-faced, 20-year-old youth with ruddy complexion. Beard was scanty and downy in quality. An excess of subcutaneous fat gave him a femininely molded shape. Otherwise examination was negative. The external genitalia were normally developed.

He was an immature-appearing youth, reserved and shy, who offered no spontaneous conversation. When addressed, he answered in as few words as possible but was courteous though embarrassed. He blushed easily. On the hall he was seclusive and spent long periods in deep preoccupation. His facial expression was that of one mildly depressed. His trend concerned homosexual impulses and he related homosexual experiences at 16. He was distressed by his masturbation associated with vivid phantasies of homosexual relations. He was worried because of his love for his room-

mate, toward whom he had strong sexual desires. He felt hopeless because as a homosexual he could never enjoy family life or the companionship of his own sex. He spoke frankly of a suicidal attempt. He was anxious to be helped and accepted his hospitalization. There was no evidence of projection, of ideas of reference, delusional formation or hallucinations. Sensorium was clear; intelligence above average.

Treatment discussion: This patient was immediately placed on a program including daily periods at the gymnasium and occupation. At the gymnasium less competitive forms of exercise, such as bowling, were stressed at first, and he was started making a basket at occupation. In therapeutic discussion the question of human bisexuality was immediately taken up with him and thoroughly considered at first from the strictly physical point of view. Gradually personality development, with the changes of attitude and interests that attend it, were discussed in its broad aspect. Later the development of sexual instinct was considered and correlated with associated personality attributes. Intelligent, the patient was able to understand the general points involved and soon was able to demonstrate in his own life facts in relation to these points. He discussed frankly the conditioning influence of his mother, his early conscious overattachment to her, with its associated fear of his "reserved, self-contained, strait-laced" father. He recognized how with his puberty he resented his deep mother-attachment and reacted to it by criticism of her. His hero-worship of his physician brother and his tendency to imitate him without considering his own interests and capacity soon was brought out and considered thoroughly. He spontaneously associated his discomfort with aggressive individuals—the football coach at school, for instance—with the discomfort he had long felt toward his father and the inferiority he had felt toward his brother. A longitudinal view of the manifestations of his own sexual instinct led him to see how it had not been a static affair but was developing. Frequent talks concerning homosexuality in general led to a gradual desensitization to his own homosexuality which he began to sublimate by interest in printing in occupation and a greater freedom of social contact with other patients of all ages. He began to enjoy with lessening conflict intellectual discussions with others and became

more tolerant to the exuberance and aggressiveness of other patients, whose personality organizations were different—after discussions regarding the origin of his conflicts concerning them. He recognized his tendency to bury himself in a book as an escape from social contact and reading became an interest of more natural proportion.

Distress at learning of the suicidal effort of his roommate at college, led to a greater understanding of his attachment to him and a recognition that personality difficulties were not necessarily only associated with those of his temperament and interests but were dependent on broader factors. He became interested in contacts with his friends and at first was encouraged to have them visit him in the hospital. Weekends at home soon led to his returning to college to visit his friends there for a few hours. Discussion of his reactions to these visits led him to see himself more clearly in relation to others and caused him to lead a life, when out of the hospital, more in keeping with his interests and desires.

Four and one-half months after admission, in June, 1937, he left on an extended visit. Since, he has returned to school and successfully competed for the football managership. He has become interested in college publications and spends more of his time in this activity than in his football contacts. Reports from his family indicate that he is adjusting successfully, is on the dean's list for proficiency in his studies and is taking his place in the social life of his fraternity.

In this case we see obvious constitutional factors of etiological importance. A glandular imbalance probably determined his obesity and may largely have determined his gentle and passive manner which fell in so unfortunately with his mother's desire to make a girl of him. The endocrine upheaval of adolescence resulted in a habitus more masculine but did not remove the rounded contours and unbearded face which gave him a feminine appearance on admission. However, whether this constitutional factor was present or not, the influence of his eccentric mother in dressing him as a girl, encouraging him in feminine interests and trying to keep him emotionally bound to her by her oversolicitousness must not be neglected. Adolescence was made doubly difficult for him by the conditioning influence of his environment and he was decidedly

unprepared for his struggle for emancipation. It seems remarkable that with these handicaps he did as well as he did. This indicates, I believe, the natural elasticity in man which may be lost to sight at times in our evaluation of the prognosis of our patients. This patient's conflicts were not settled entirely; he still has to live with certain unmodifiable liabilities. The emotional burden of his conflicts was definitely lessened and he showed the ability to deal with them with intelligence when once this burden was lightened. On return from a visit home once, he said, "You know, I feel older than some of the others now; they look at some things in a remarkably silly manner."

A second case, similar to the last one, we shall consider in less detail:

J. C. was a 21-year-old fourth-year college student who was admitted here August 19, 1938, because of depression and suicidal preoccupation.

In the family history, of contributory importance was found a paternal aunt who suicided in a depression, a maternal grandfather who had wide mood swings and a maternal grandmother who was periodically addicted to drugs. The father was successful, extraverted, well adjusted. The mother was pathologically sensitive in reaction to partial deafness and lived entirely for her children, boasting she was "just like a sister to them," without recognizing how closely she bound them to her.

Spoiled by his mother, the patient had a stormy childhood and early adolescence, so far as his social relationships were concerned, as he demanded his own way, was a poor sport and a tease. When he was sent away to boarding school at 15, at his father's suggestion, his behavior quickly became acceptable. He was closer to his mother and reserved and uncomfortable with his father.

Sexual activity was marked from the age of 10, including mutual exhibitionism with his sister two years younger, masturbation from the age of 11 and mutual masturbatory experiences and mutual fellatio with boys of his own age from 12 to 15. Masturbation with homosexual phantasies continued from 15 until shortly before admission.

He did well at school, entered college at 18, where he was outstanding in extracurricular activities, popular and respected by

his classmates, being elected to several coveted positions by the student body.

Handsome and with a pleasing social manner, he was a favorite of female acquaintances who invited him to many parties. He showed no preference for any girls and had no heterosexual experiences beyond indulging in embracing and kissing, which did not particularly arouse him.

In the two summers before his admission he worked at a summer resort as a parking-lot attendant, being bossed by an aggressive classmate with whom he had had masturbatory experiences in his early adolescence. His work was a great blow to his pride, inflated by his respected position on the campus where he was a leader, and he disliked it heartily. He did not have to work and could have had more pleasurable positions at home but he felt the need to be on his own. In July, 1937, before his present illness, he made a firm resolve to stop masturbating before starting for his summer's work "to prove he was a man." At this summer job he again hated his work and his aggressive roommate, the classmate referred to above, who seemed to overwhelm him with his aggressiveness and made him feel inferior and immature with his boasting of heterosexual conquests. About the middle of July he was approached by a pervert who neatly led up to his invitation by the question, "Whom do you like best, your father or mother?" The patient replied that it was his mother and a gross homosexual invitation followed. Following this the patient became depressed, preoccupied and felt more and more incompetent. After an unsatisfying, incomplete sexual experience with a girl of his own age on August 11, he decided to return home. On the way his worries for the first time became entirely centered upon the question of his own homosexuality. About a week later he entered this hospital.

Physical examination was negative except for his general body build, which revealed disproportionately long legs in relation to his torso. His features were regular and finely chiseled. External genitalia were normally developed.

Mentally he was deeply preoccupied with depressed and suicidal thoughts concerning the question of his homosexuality. He attempted to cut his wrists with a broken lamp bulb 36 hours after admission. Ideas of reference concerning homosexuality were a prominent feature.

Discussion of the nature outlined in the first case was entered into and the patient was encouraged to follow an active program with emphasis on sports, at which he was proficient. At the end of 10 days the only symptoms he displayed were a slight quietness and self-consciousness. He had entered actively and spontaneously into all social and athletic activities and worked consistently and well at occupation. Within a month he was on a convalescent hall and six weeks after admission made his first trip home over a weekend. He returned more depressed and was self-depreciatory although not entertaining ideas of reference. He cleared rapidly from this; in a few weeks became entirely at ease socially and for the first time began to lose his reserve with his father. He left the hospital four and one-half months after admission, recovered, maintaining that he recognized he was not matured yet and was content not to try to force this development as he had in the past. He has entered his father's business where an excellent opportunity awaits him.

Constitutional factors are less evident in this case than in the previous one, although they are suggested by the torso-leg disproportion and the feminine fineness of his features. In this case, also, we see difficulties in emancipation accentuated by a strong parental bond, apparently determined largely by the insecurity of an immature mother who adjusted poorly to her husband and was threatening divorce at the period of the patient's illness. His relationship to his father was less close because he was away from home on business so much of the time. Guilt over his adolescent homosexual activity and his masturbatory phantasies, as well as probable guilt connected with his mother-attachment, determined this patient's rather hectic and abrupt attempt "to be a man" and emancipate himself. Unready for this, he had a depression. In the hospital he gained a tolerance of himself and his sexual impulses and was able to see that further personality development along broader lines was necessary in order to complete his emancipation. He apparently is no longer under the pressure to grow up all at once and is facing life more calmly.

A third case, Dr. B. S., is illustrative of the gradual process of maturation of the personality. He was a 26-year-old physician who came to the hospital in a mildly overactive manic state. His father

had died when he was young and the family sacrificed their own comfort to put him through medical school. This he completed at 22, following which he had two and one-half years of experience as an interne and for about one year had been in private practice. Between the ages of 10 and 12 he was the active and passive partner in sodomy on many occasions. During adolescence and until his internship at 23 he showed no interest in the opposite sex although he was physically attractive to them. Generally he sought the companionship of his own sex. He was seduced by an older woman at 23 and later, on a "dare" at 24 started an intimate relationship with a woman of 40. Pressure from this friend and from his mother to marry, and dissatisfaction with his work, precipitated a manic excitement in which homosexual conflicts were obvious. He began to improve after five months hospitalization and was discharged, recovered, within one year. During his stay here he discussed his difficulties frankly with his physician, detailing his psychosexual conflicts. Since his discharge from the hospital more than thirteen years ago he has practised medicine successfully, married and has had several children.

SUMMARY

1. The physical and psychological aspects of the bisexuality of man were discussed.
2. Conflicts associated with the homosexual stage of psychosexual development and their therapeutic implications were considered.
3. Three case histories illustrative of the tendency of patients to develop toward psychosexual maturity were given.

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REACTION OF A JUVENILE DELINQUENT GROUP TO STORY AND DRAMA TECHNIQUES

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Play, story, puppet and drama techniques have been used in the study and treatment of normal children and those with behavior disorders. Piaget,¹ Isaacs,² Levy,³ Schilder and Bender,⁴ Bender and Woltmann,⁵ and Despert and Potter,⁶ have discussed the subject in recent contributions. While engaged in some corrective and remedial educational speech work with school children, it occurred to us that the creative techniques used in elementary and secondary schools might be employed as a stimulus for a juvenile delinquent group.⁷ This study was conducted primarily for the purpose of observing the reaction of juvenile delinquents to the above techniques in comparison with the reaction of average school children of the same age.

The therapeutic applications are dealt with only indirectly. It was found necessary to separate the children according to their ages. The techniques applied to a group of children between the ages of six and ten could not be applied to the older groups.

CLINICAL MATERIAL

The delinquent group herein presented included both sexes whose ages ranged from 13 to 17. Their I. Q.'s varied from 70 to 100. The material was garnered from juveniles who had been referred by the court. The group was comprised of adolescents with conduct disorders sufficiently severe to be classified as delinquents, that is, repeated offenders.⁸ These included children with asocial and amoral trends, with pathological emotionality and pathological sexuality. About fifteen were observed at a given time, but more than 100 children were observed in this manner since November, 1936. The average period of observation was about four months, but many cases were observed for a period of over one year. Children between the ages of 13 to 17 in the public schools of Oneida, Syracuse and Fulton were utilized as our normal control group. The study was based on the actual techniques developed for speech education which were presented in the same manner as in the class room. All material was introduced as informally as possible.

PUPPET TECHNIQUES

Rag puppets representing both sexes and various ages were brought into the activity room. An attempt was made to attract the attention of the group to the small figures. A brief but informal explanation of the mannequins was made. The manipulator "made one of the puppets talk, ask questions and answer any queries which might be asked." Then the children individually were permitted to examine and manipulate the puppet and their reaction was noted. The members of the group were stimulated to learn "to work" the marionette. The boys were asked to get cardboard cartons or crates and to endeavor to construct a puppet theater, and the girls were to make marionettes. Both of these efforts were under the direction of the occupational therapy department. Vegetables were strung in marionette fashion.

The introduction of the puppets did not result in the attention nor evoke the interest and response seen in the average school child. In fact, it was evident from the first that each member of the group was much more interested in his or her own activity, and indulged in this a great deal of the time. There was little if any desire to manipulate the marionettes. Movies were taken but few of the children were genuinely interested. Instead of manipulating the puppets, the boys would kick them or swing them over their heads until they became a mass of strings and the puppet had to be abandoned for repairs. The boxes for the theater building were only started and then forgotten. Since most of the construction proceeded on an individual basis it became impossible to prevent intervention from the other disinterested but restless members of the group, who soon persuaded the minority to abandon their project and join in destructive pursuits. Scattered remnants of boxes were left here and there for someone else to clear away. In fact, the group seemed to be disinterested to such a degree that most of our time was spent ascertaining causes of dissension. Some of the boys constantly wrestled about the room and, seeming to resent the effort of other boys, snatched the box theaters and used the mutilated boxes for footballs. They also struck the puppets and subsequently the boys snatched dolls, wadded them up and threw them at others. When one attempted a brief monologue, some would

listen for a few minutes and run away. When one of the girls tried to manipulate a puppet, other girls either carried on destructive comment or became absorbed in their own conversation or differences.

A few of the girls attempted the construction of "doll marionettes." However, many refused to manipulate them. When asked why, the girls frequently said, "Its dress is ugly" or insisted that their marionette was not as pretty as A's or B's. Little response was elicited when the vegetable puppets were employed, except for destruction by swinging.

It then became necessary for the teacher to take the initiative and to present her own puppet production to the group. The techniques employed were similar to those used in drama and story techniques. Temporarily, they evinced some curiosity but fatigue and lack of sustained attention and interest soon became apparent. A bored attitude prevailed. Humorous and derisive criticism of the performance as well as private conversation were again in evidence. The girls giggled and gossiped among themselves in a secretive manner. The boys were more boisterous in their asides, ridiculed the performance and proudly criticized the effort. There was a decided lack of respect for the performer or the physician.

Later, when the W. P. A. Players produced the "Lives of Musicians," the reaction to the Life of Haydn was most marked. Haydn's father, it will be recalled, forbade his son to take lessons on the harpsichord. In the written comments, the lives of the other musicians were entirely neglected and most of the productions concerned themselves with stressing the point that the "bad father" would not allow the boy "to do as he pleased."

The interest of the average younger school child to puppet techniques is well known. The marionettes are accepted with interest and enthusiasm. When construction of theaters had been suggested, they often voluntarily asked the aid of the adults in their family and discussed the matter with them. The school children were quite willing to make costumes and create original plays. In some cases the children in the school asked for the return of the individual puppet characters and welcomed them as "friends." However, older normal youths frequently became bored with the puppet shows after the first few performances.

DRAMA TECHNIQUES

The group was asked to produce a play and a choice was permitted. They were to do (1) any play "made up" by one of their number, (2) a formal play, (3) a "make-believe" radio playlet, (4) a play formulated as a project which the group might produce, (5) a play to be completed by the group, and in addition, (6) stories of dramatic content were read to be reenacted. Some suggestions as to the characters were made in the formal play but no attempt was made to force characterization.

The only successful attempt at drama made by any group was a "radio amateur hour." It was difficult, however, to stimulate one of the group to act as the announcer and repeatedly the program lacked a master of ceremonies. The members of the group had to be prompted all through the performances as they evidenced little if any imaginative power. Few admitted talent except some of the girls who tended to overdramatize. Most of the others were apathetic. Popular songs alone were demanded. A few of the girls claimed they wished to be night club performers and sang "blues" songs. Some of the boys sang but often sat on the floor or out of sight and away from the improvised microphone. Some sang fragments of cowboy songs. The others joined in spasmodically. Occasionally, two or three girls urged to do so, did a dance step or two together. There was lack of coordination of movement, grace and rhythm. Individually they did much better. They preferred to dance to "swing" music. Most of the girls chatted audibly without attempting to make any contribution to the program. Destructive criticism and antipathy were again in evidence. Some of the girls who attempted to cooperate were so subjected to group antipathy that it eventually resulted in their rejection and an emotional outburst on their part when they sensed that they were not accepted. A few were interested enough to attempt characterization.

During all programs individual activity went on oblivious of the group activity. Frequently boys hid behind the blackboards; some dismantled the light, others turned the victrola off and on. Frequently the boys would stop, stand in front of a performer and stare or hold their hands to their noses, then shout and run away.

The reading and acting of Joseph Egan's "Dame Gossip and

Her Little Rumors'' brought some mild response from the girls in some groups. The story is that of a strange woman who moves into the neighborhood, and about whom Dame Gossip spreads malicious little rumors only to find, after the sheriff has been called to arrest the woman as a suspected thief, that she is a philanthropist. Some of the girls did volunteer to take parts. A few of the boys were induced to participate. Most of the dialogue had to be supplied by the director of plays. Constant stimulation was required to get any response.

When it was suggested that each in the group write a short play or cooperate in fashioning a play, many announced that they had written or at least knew how to write a play. At the next meeting of the group when they were asked for the play, they made various excuses stating that they did not have a typewriter, that their play did not satisfy them or was unfinished, that they had forgotten to bring it or had torn it up. Some refused to submit their plays and seemed ashamed of them. A few presented short, unfinished productions. A half-hearted attempt was noted even in the few who wrote complete plays and the sequence of events was difficult to follow. When one finally did reach us, it was so scant in ideas or imagination that it took but a very short time to produce. The efforts concerned themselves usually with the inconsequential, everyday realisms associated with eating, sleeping or minor activities. One girl wrote pseudohistoric plots involving lives of queens, in which she always chose the menial role. She was the illegitimate daughter of a servant girl and a wealthy manufacturer's son. The majority of the group refused to act in this.

This is a different reaction from that shown in the schools. The normal children frequently had suggestions to make. They entered eagerly into the spirit of things, even requesting certain parts. They work well in groups and show ingenuity in their creation and reproduction of skits. Even the slow and shyer ones evidence an interest and will attempt some effort after a lapse of time. Those who could not write plays admitted their failings but participated willingly in those created by others. Some excellent programs have been attempted which were the cooperative work of an entire class for assembly production. Criticism was rarely destructive.

From the creation of plays the delinquent group proceeded to the reading and acting of given one-act plays (acting in the sense of "walking rehearsals"). The parts were assigned and members asked to read the parts. The majority of the group would not read the lines and evidenced no desire to do so. They would repeat such lines as were read to them. This resulted often in a change of lines and content.

One of the formal plays to which some response was made read as follows: Three adolescents, Eddie Johnson, Madeline and Ellen, her younger sister, started for a dance. Eventually, through a mistake of the street car conductor the three found themselves, without money, 40 blocks from the dance. They stopped to rest their aching feet in the park and discussed the procedure to be followed. In the course of the conversation, Eddie revealed the fact that his father refused him the car because of mechanical difficulty caused by Eddie's carelessness. Madeline stated that she accepted Eddie's invitation because she thought he would have the car. Otherwise, she stated, she would have gone with Eddie's "slick cousin" Elmer. Ellen said she hated to be a shadow to her older sister, Madeline. Elmer, who obtained the father's car by deceit arrived in the park and easily persuaded Madeline to go on to the dance with him. Eddie and Ellen continued their conversation on the sadness of their lives and they began to realize they were interested in each other. Eddie's father then arrived on the scene. Explanations followed. Eddie realized that Ellen had sympathized with him and asked her to go on to the dance with him and the two went to the dance in a taxi with Eddie's father, who planned to punish Elmer.

The delinquent boys assigned to the father's part were pleased. Some revealed very definitely their own father antagonism. There was much laughter based on a double meaning they assigned to certain lines in the play. There was evidence of their own "sophisticated" ideas on sex and their own fantasies.

The following is one of the enacted endings for this play, entitled "Three's a Crowd"—a group effort:

Scene: The porch at the dance hall. The father, Eddie and Ellen arrive in a taxi. Elmer sees his uncle and the others.

Elmer (played by a boy who overcompensates and blusters): Here's Paw, Eddie and the dame. (Discussion ensued apart from

the play concerning the relationship of the three males in the play, which delayed the presentation).

Johnson, Sr.: Who said you could take my car?

Elmer (readily): I don't know who took it.

Johnson, Sr.: What about the car? You said you wanted to borrow it.

Eddie: I said I wanted to borrow it to come to the dance with a girl friend.

Johnson, Sr.: Never mind, Eddie. (to Elmer) I feel like taking care of you right now. But seeing this is a dance hall, I'll wait until I get home. Where's the car now?

Girl: Elmer, you brought—.

Elmer: (still in a blustering manner) Well, what about it?

Girl: —dance with me—.

Eddie: If I dance I'll take my shoes off.

Johnson, Sr.: Elmer, you come home with me.

Elmer: I'll sit right here and what are you going to do about it? (blustering)

Johnson, Sr.: Eddie, be home in time for school. (makes a move to catch Elmer who runs away, father chases Elmer all around the room.)

The delinquents were not satisfied with the implied punishment of the deceitful cousin but often desired to add a second scene to the play, which was to occur at the meeting of Elmer and the father. They insisted that they wanted to see cousin Elmer punished in actuality, relished the enactment of this scene and helped it along by joining in the pummeling.

The normal group seem satisfied that the hero and heroine eventually arrived at the dance after the tribulations which they had undergone and were pleased that the boy's father assisted the young couple to get to their destination. They enacted the play as read.

Later, another play was read by the members of the delinquent group, concerning poets in Spain and a beautiful dancer. There was no apparent interest and the group, even including those actually reading, did not bother to listen to the others but became absorbed in their own individual pursuits. The boys called it a "sissy" play and the girls were bored.

The children in the schools were quite interested in most plays and liked to portray characters. They were not so insistent on a particular role except that the important parts were usually coveted. Once, however, the parts were assigned, petty differences were superficially disregarded in behalf of the group effort. Even

those retarded in academic subjects strove to compensate in their dramatic roles. There was always a competition for parts and the getting of "properties" and making scenery. Even the reading of a play is recreation to the average adolescent. Those who do not actually participate enjoy listening. In general, the adolescent group in school attempted to write plays or poetry much more frequently. They expressed at times mature imagination and sympathy, which was lacking in the delinquent group.

A few examples of the productions of individuals in the delinquent group follow:

THE WEDDING AND THE COOK

(Written by an illegitimate child, daughter of a cook, adopted by friend of her mother; 14 years of age, given to stealing and lying)

I

Rich girl: Father, I am going to be married.

Father: Who are you going to marry?

Rich girl: He is a wonderful man. He is coming today. Ah! There is the doorbell. It is he.

Father: So, you are the lucky man. You have my luck. When will we set the date?

Man: June 1, 1937. I will tell the cook for that is today.

Cook: I will be ready. Oh, I have lost my cooking book. Well, I will have to do without it. This is the recipe I will use. 1 teaspoon hot pepper, 12 pounds of meat, 1 jar of salad dressing and 1 quart of milk.

Man: This food is wonderful. Oh, this is terrible! Where is that cook?

Rich girl: I will take care of her.

Man: Well, I will go now.

Rich girl: Father! Father! All my jewels are gone. That man was a phony. He took them.

Father: You will not marry him. It will teach you.

* * *

THE GOSTH (GHOST) AND THE OLD LADY

(This play was written for the doctor by R. V., male, 15 years of age, of Italian parentage, homosexual, pilferer, I. Q. 75. This was reproduced from the original as accurately as possible due to difficulty in deciphering some of the words. Note spelling and construction.)

"In the room was sitting an old lady knitting herself a pair of stockings. It was about twelve o'clock midnight, she couldn't sleep so she started knitting along, when suddenly (suddenly) a window opened and a figur (figure) rushed in the room and as she

was knitting she saw a shadow of the Gosth (Ghost) from in the other room through the room it was opened in her bedroom. She stood quite (quiet) for a minit (minute) and then she got up and took hold of her cane and walk in were (where) the figur (figure) was staying so she went in and hit him over the treable (terrible) head and the Mr. Gosth (Ghost) earied (cried) out, "Ouch, at (that) was my nut you have hit." "Shut up, you seeter (?) thief." Then the figur (figure) threw up his hands in the air, and the woman got afired (afraid) so she spuch (sprang) in the air and jumped up and down and earied (Cried) "Oh, Mr. Mr. Mr. G-O-S-T-H (Ghost) pelase (please) let me go and the G. picked her up and opened the window and throw her out she landed 55 sties (stories) high and the Gosth (Ghost). The end."

Part II

THE OLD LADY AND GRANDCHILD JOHN MURPHY

"The figur (figure) went up the stairs and saw the child J. M. sleeping then he hit aloud, "Get up, you rat, or I'll throw you out of the window like I did to your grandmother." J. M. awaked and said, "So, is at so you funny looking thing, I'll bust you head" and he took out of the drar (drawer) a gun blew his brains out. The end."

STORY TELLING TECHNIQUES

The story telling technique was employed in various ways. The stories chosen because of their appeal to the average child based on age level interests were first read to the group. Then a portion of a story would be read and comments as to the ending asked. Often it was suggested that the story be enacted. Some stories which are used for character building in the school speech program such as Eagan's "Wings of Flame" were used. Often the individuals were asked to choose from a list of titles the type of story they wished read. More effective was the use of the original "build up" story which was started either by a member of the group or the teacher with each one handling a portion and leaving the next person to add to it, or ask questions. The loose ends were gathered up by the group as consistently as possible.

Most of the group listened at intervals. The more blasé members frankly classified these as "sissy" things. Each had an individual preference for some type. If another story than his or her preference was read, they promptly lost interest. If the story touched upon something familiar to their own experience there would be a show of interest. At times, however, as if disgusted that there

should be such an impulse, there was inevitable recoil on the part of some of the group.

The members of the group were reluctant to recount a story read and would change the subject if possible. Often this change led to informal conversation and some volunteered adventure stories of their own. These were often the delinquent's own story poorly disguised and told apparently for the sake of justifying himself or ventilating his conflicts.

When the stories were to be completed, at first only a few wanted to add to them. In fact, it seemed as if the group wished rather to be read to than to make any contribution. Some of the group would invariably protest at story time. However, later once a story was read and one of the group permitted to complete the unfinished story while the others questioned the details, there was more response.

A representative story is the following:

One morning a man who lived in an apartment hotel or rather a big apartment building came downstairs in the elevator. He went to the desk to find out if there was any mail. He then remembered he wanted to ask the elevator boy something. But when he returned to the elevator he saw it was in the basement. He went down the stairs and—.

Some of the suggested endings were: (a) That downstairs he found the elevator boy dead. He went upstairs in the elevator to call the police. Then he went back downstairs but could find neither the stairs nor the elevator; (b) that the man had been in India and had stolen a rare jewel; (c) that the man was unable to find the elevator boy, went to the police only to find nothing but his hat and coat on the desk where he had been sitting; (d) that the body was taken to the morgue and all the morgue attendants became lost; (e) finally after another elevator boy had been found dead on top of the elevator, placed there by the hotel owner and the manager because he knew too much, (f) a fire occurred in which an old Indian fakir recovered the jewel and disappeared forever after.

One girl volunteered to retell the story. She stated that the boy friend of a girl who had been divorced from her husband and had fallen in love with someone else was suspected of murder. This was woven into a fantastic tale which involved the former husband

who out of revenge had killed the elevator man, who was an uncle of the girl. From this, the crime was solved by mention of the uncle's beard. When the ex-husband had known the uncle, the old man had been smooth shaven. Accused of the crime, the man mentions the uncle's beard. This showed he had seen the uncle on the day of the murder. When the story teller finished one of the boys was asked to add to the plot. He started at the observer with a supercilious air and announced, "Then they woke up and found it was all a bad dream. That couldn't be real."

On another occasion when three of the patients were apprehended planning to escape from the hospital, the boys involved were brought into the room and the teacher informally began to chat with them about the Foreign Legion. Fragmentary descriptions of escapes of the Legionnaires were read. Then the conversation was directed to the prisoners on Devil's Island. The teacher mentioned that one story of escape came to mind. At the word "escape" one boy supposed to have been involved in the plot winked at the other when he thought the teacher was not watching. The boy suspected of "squealing" looked very serious but nothing was said.

The teacher then related a few incidents of an imaginary episode where some "trusties" had planned to escape from Devil's Island, but were prevented from doing so by the confession of one who was afraid. Then the two boys, who seemed very cold to the third boy, were asked what they would do with such a fellow prisoner, even though he was prompted by fear of punishment. Almost in one breath with a well-directed look at their companion came the answer of the other two, "Kill him."

Another variation of this type is the question-answer completion of the unfinished story illustrated by the following:

A boy went up in a balloon. He traveled a day and a night. He landed on an island far away. He lived there nineteen days. What happened? What did he do?

One of the delinquents then took up the story by saying, "He landed on this desert island—"

Question: What did he eat?

Story Teller: Cocoanuts.

Question: Were there any people?

Story Teller: He found cannibals there.

Question: What did he do?

Story Teller: He killed them all.

Question: How many were there?

Story Teller: Oh, about 19.

Question: What did he do after he killed them?

Story Teller: He buried them right there.

Comment: Wow! A tropical island—suppose he hadn't buried them—Boy! (holds his nose and then says "Why").

This is continued until the questioners and the juvenile story teller reach a deadlock, and the "Whys" are exhausted. The group relished the arguments which ensued.

The delinquents were not as responsive to the story telling technique as were the average children although they reacted better to the story completion than to other techniques. However, the last form of question-answer completion story brought the best response and will be utilized and investigated further, as the heated discussion reveals much of the personality of the individuals in the group.

Informal conversation and socialized speech technique led usually to a discussion of the hospital residence or clinic attendance, the immediate problem and events which led through the court or agencies, and a discussion of their problems, mostly family relationships. Some of the group would ask about the others. By tactful questioning, they were encouraged to talk without fear of condemnation or disapproval of undesirable qualities. Their conversation was not so closely linked to the events outside their immediate interest and revealed egocentricity and a tendency to blame others. There seemed to be no vital interests aside from relief from their immediate conflicts and problems. There seemed frequently to be a sense of guilt and suspicion, and a desire to outwit and evade the issue.

One boy appeared to think that it was very unfair that he had been sent to the clinic because he took a car, which he said belonged to him and not to his father, but of which he had been deprived while on probation. He could not see why he should be condemned by his father because he had stolen and sold a typewriter which no one used because he had to have the money with which to pay a bill at once for a girl who claimed he got her into "trouble."

COMMENT

It has been stated that delinquency usually represented one way of obtaining satisfaction for motives inadequately solved in the more acceptable ways and indicated the individual's incomplete or unintegrated attempts to solve his problems. Much of the behavior so far as socialized activity and integration was concerned, seemed to parallel the reactions of Piaget's children. Their activities in general satisfied a particular motive for a brief time but were not consistent with the best interests of the group. The individual ego was most important. There was a lack of ability to change and a retention of infantile standards of behavior. There was a tendency toward lack of fair criticism and of the ability to compete in a socially acceptable manner. Destructive criticism, particularly of the opposite sex, was frequently noted. Aggressiveness was prominent in some but not from the standpoint of outstripping others so much as destroying the efforts of others, by means of lies, gossip or most frequently (as in the case of the boys) by actual physical measures. Respect for authority was usually absent. Cliques set themselves apart in order to hinder the efforts of the group. They minimized their own faults and blamed others. Many were apathetic and did not care to compete except on their own terms. They were unable to express their thoughts and actions in word symbols. There was a general lack of integrated verbal formulation or creative speech.

CONCLUSIONS

The lack of integration of the personality and conduct of this delinquent group was apparent. With careful consideration of background, education and intelligence, we observed the following facts: 1. There seemed to be a lack of creative ability in response to story telling, puppet technique and creative dramatics. 2. Individual effort predominated in contradistinction to combined group effort. 3. These individuals centered their interests in and about their own conflicts. 4. A destructive attitude and destructive criticism of the work of others was manifested with little constructive effort. 5. There is a tendency toward certain traits with overcompensation or underdevelopment in regard to other traits, without balanced average response or reaction. 6. The qualities neces-

sary for leadership are lacking and there is an inability of the individuals to bestir themselves or the group to combined actions.

The necessity for further control study is indicated, as are longer periods of observation. There is some indication that the group techniques now employed will have to be modified somewhat to prove effective in the study and treatment of juvenile delinquency. Best results were obtained with story completion techniques, which seemed to stimulate the most favorable response in juvenile delinquents. More is accomplished when boys and girls are segregated. The groups must also be separated as to age levels. The play and story techniques must be fitted and adapted to these age levels and interests and must be based on the emotional and intellectual maturity of the individual.

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A REVIEW OF THE RESEARCH AIMS OF THE NEW YORK STATE PSYCHIATRIC INSTITUTE AND HOSPITAL, 1938*

BY NOLAN D. C. LEWIS, M. D., DIRECTOR

Mental disorders constitute various types of events occurring in the lives of certain individuals. These disorders develop and progress in accordance with natural laws in general and with the laws characteristic of physiology and psychology in particular. In the past some of these phenomena of behavior have been elucidated or at least demonstrated by the application of special methods of several branches of science, a fact which should encourage us to continue these methods and to devise still others in an attempt to discover the causes and situations which form the mental disease picture.

Along with other living organisms man is groping, often in the dark, for the most satisfactory life adjustment possible, and in the midst of this he not infrequently becomes distorted and diseased physiologically, intellectually or emotionally. In an attempt to find the causes of these troubles the bioscientist is also groping, which means that he is feeling and exploring in all directions for a beam of light. But he must do this in an orderly fashion and in accordance with some systematic approach avoiding the dilemma mentioned by Lord Chesterton, who is alleged to have said, "Much research reminds one of a blind man in a dark room looking for a black hat which is not there."

At the Psychiatric Institute and Hospital we continue to strive for the promising leads regardless of the special field in which they may focalize, and today with the limited time at our disposal I can touch upon only the high spots and emphasize only what we consider as important trends in thought.

Although cooperative research is active between our intramural departments, for purposes of presentation I shall consider each department by itself so far as possible in order to show the distribution of interests.

Department of Clinical Psychiatry

Nearly all members of the department of psychiatry have been engaged during the year in various types of investigative problems.

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Under the supervision and with the collaboration of Dr. Harris of the department of internal medicine, studies have continued on the use of insulin hypoglycemia and metrazol convulsive therapy in selected clinical cases of schizophrenia and a few other types of mental disorder.

Drs. Hinsie and Strongin continued their investigations on the parotid secretion in various groups of mental disorder. The studies at present seem to indicate that in the future the parotid secretory determinations may be of diagnostic significance in the field of psychiatry. The studies have been extended to include large groups of patients in other hospitals of the Department of Mental Hygiene and in several hospitals physicians of the staffs have indicated an interest in making these determinations and have been trained to do so. Thus it is hoped that large groups of patients will be studied.

The need for a comprehensive dictionary of terms used in psychiatry has long been felt. The task of compiling such a dictionary is being undertaken by Drs. Hinsie and Shatzky of the library staff. It is believed that a minimum of two years will be required for completion of this gigantic task.

The importance of electrical studies as exemplified by the electroencephalogram, the technique of which is becoming progressively refined, has increased greatly in the fields of neurology and psychiatry. At the Institute a number of studies have been undertaken in this field in both psychiatry and neurology. Electroencephalograms were made of patients throughout the metrazol seizure and in cases in which subconvulsive doses were given. Among other things it was possible to produce characteristic electrical changes in the brain with metrazol given even in doses insufficient to cause clinical convulsions. A paper summarizing these original and interesting studies on the effects of metrazol on the electroencephalogram has been submitted for publication by Drs. Hans Strauss and Walter Rahm. The electroencephalograph during the past two years has assumed considerable importance in the field of localization of brain tumors in neurology. By special arrangement with the New York Neurological Institute it is now possible for electroencephalographic studies to be made by the department at the Psychiatric Institute on all cerebral neurosurgical cases on the

service of Dr. Byron Stookey at the neurological institute. As a first approximation, all electroencephalographic analyses are made "blind" without any knowledge of the clinical condition of the patient or the diagnosis. It is hoped that by this combined study with the neurological institute valuable records will be obtained on a large and surgically verifiable group of tumors and of pathological conditions of the brain.

It has been known for some years that patients with convulsive seizures may manifest certain electrical patterns which have been considered as characteristic of a convulsive state. It was thought to be of considerable interest and importance to make electroencephalograms on siblings of patients in our mental hospitals diagnosed "idiopathic" or "essential epilepsy"; in the hope that some familial electrical characteristics might be picked up which in turn would indicate a potential convulsive disorder in these siblings and which might possibly be prevented from becoming manifest convulsive disorders by proper medication. Through the cooperation of the Commissioner of Mental Hygiene and the superintendents of the various hospitals in that department it has been possible for us to obtain the names and addresses of all relatives of patients in our hospitals diagnosed idiopathic epilepsy. The siblings of these patients are being studied electroencephalographically. It is too early as yet to make any predictions regarding the outcome. A fund of \$2,000 for technical assistance in carrying out this work was granted to Dr. Barrera by the Friedsam Foundation of Child Neurology.

Within the Institute electroencephalographic studies have also been made of selected cases; for example, studies have been made of a fairly large series of organic cases found on the children's service. Indeed, studies have revealed that in some cases an organic substratum must be suspected even though before electroencephalographic analysis an organic defect had not been considered. Such studies may throw important light, in the future, on the basis of some, as yet rather ill-defined, disorders of childhood. Because of the fact that the electrical potentials as obtained in the electroencephalogram in all probability originate, at least in the main, from the cerebral cortex it seemed of interest to observe what effect air, between the cortex and the surface of the skull,

would have on the electroencephalogram. This experimental condition is of course present in the air encephalogram, therefore, electroencephalograms have been performed on all cases in which air encephalograms were performed. Although definite conclusions at present are not entirely justified it seems that in the presence of some organic defect in the brain the presence of air brings out abnormalities in the electroencephalogram which under normal conditions without the air, are not manifest. This study is being continued.

The relationship between certain psychological phenomena and the electroencephalogram has never been clearly determined, although certain relationships have been generally assumed to exist. A project has been initiated by Dr. Williams of the department of psychology in an attempt to determine these relationships. It is known that some changes in the electroencephalogram are related to various kinds of stimulation, attention, emotional upset, sleep, hypnosis and perhaps thinking, but in most instances these relations have been worked out neither extensively nor exactly. The psychological phenomena themselves have not been well defined and almost never adequately controlled. In this study common factors are being sought in psychological situations which are apparently different but which produce similar changes in the electroencephalogram. Also, the range of situations capable of producing changes is being determined. Finally, a more exact definition of the psychological factors involved is being attempted.

Increased emphasis on the importance of neurological and psychiatric studies in children has been manifested during the year in the children's service under Dr. MacKinnon and Dr. Kenneth Kelley. Air encephalograms are considered routine and it is interesting to note that by these studies several cases have revealed organic substrata for clinical conditions which otherwise might have been classed as simply functional in type. Attention has been directed to studies concerning the importance of various play techniques in the study and treatment of certain types of disorder in children. Thus, use of these techniques has been made in the study and treatment of aggressiveness in children. Because of the claim that certain personality types develop or are associated with convulsive disorders, an investigation is being made of personality

types in children with convulsive disorders. In a series of these cases studies have been made on the effect of Dilantin, the drug recently used extensively by Putnam and his coworkers, in Boston, in the treatment of convulsive disorders. It is too early as yet to predict exactly the result of this study. During the last few months observations have also been made on the effects of Benzedrine Sulfate on the personality reactions and conduct disorders in children. Here again it is as yet too early to predict precisely the results of this study.

Although the relationship of the vascular system to various constitutional types, and hence to certain psychiatric syndromes, has been claimed for many years by myself it has up to this time rarely been possible to obtain any direct measurements reflecting the status of the vascular system in living patients. However, it seems highly probable that the fundus of the eye may be used as an indicator of the vascular system. With this in mind, studies have been initiated by Dr. Cotton of the resident staff of the Institute and the director, in collaboration with a member of the staff of the eye institute, on the vessels of the fundus. The technique involves the exact measurement of the fundus through the use of a specially designed ophthalmoscope from which calculations as to the vascular volume of the eye may be obtained. These measurements are being correlated with other constitutional data and it is hoped that the method will prove useful and important in determining the relationship of the vascular system to constitutional type and hence to various psychiatric syndromes.

Department of Occupational Therapy

In addition to the regular program of occupation, physical training and recreation, the following activities have been included during the calendar year 1938.

A class in dramatics for the convalescent men patients with emphasis on public speaking was conducted for six months.

With the help of one of the physicians, interest in photography has been developed among the patients, both men and women. Sufficient equipment has been purchased for developing and printing. The work has included walks on which pictures were taken, instruction in printing, developing and enlarging with very creditable results shown at a recent hobby show.

A course of instruction in magic has been given to a group of men patients by one of the physicians.

A group for the study of fine arts has been carried on under the instruction of a member of the occupational therapy department.

This department has worked during the year with the patients who have received insulin treatment. The general statement may be made that the patients have been able to carry on their usual activities in the afternoons, after treatment, with gradually increased interest and ability.

Department of Social Service

Recent contributions from the social service department to the Institute's research program have come from members of the staff as well as the students in training. A paper written by Mrs. Marian F. Graves, staff member, upon the subject "Some Aspects of Psychiatric Social Work in a Psychiatric Hospital" was presented last June in Seattle at the annual program of the American Association of Psychiatric Social Workers. Her paper describes by case illustration ways in which adults treated in a psychiatric hospital have been helped to make a social adjustment through the methods of approach and social facilities provided by the psychiatric social worker. Also, the social service department as a whole is cooperating with the psychiatric staff in the followup study and research program as outlined for those patients treated by insulin, metrazol or a combination of the two, who have returned to live in the community. The cases so followed now number 66.

During the past year, seven research projects have been completed by students of the social service department, some made in combination with a physician's study and others by two students in combination. They cover a variety of subjects: two, each with a different emphasis, concern studies of social factors and social history of adults having a diagnosis of dementia præcox; two concern social factors and maternal attitudes as expressed toward child patients under psychiatric treatment or toward siblings in the same family; one, the determinants in effecting a discharge of 25 children who were hospitalized for primary behavior disorders; another comprises a study of personality and attitudes of mothers of schizophrenic children; and one deals with a consideration of

the validity of the Rorschach method in determining capacity for relationships as applied to study of the patient's social adjustment.

At present the following projects by students are among those in process: (1) A study in combination with a psychiatrist of 25 cases of involuntional melancholia and their adjustment after hospitalization with consideration of the role played by the psychiatric social worker; (2) a survey of literature on feeding problems in combination with a study of 10 cases treated in the hospital, to determine causes, development and treatment and relation of these to the home situation; (3) A study of personality factors of family members and social treatment in relation to 12 patients treated in the hospital with a diagnosis of compulsive obsessive psychoneurosis; (4) A followup study on the subsequent adjustment of children placed apart from their families whose treatment at the Psychiatric Institute was completed during the period from June, 1935 through March, 1938.

Without a complete staff more research projects by staff members have not been possible during the past year, although there are several plans in prospect, material for which has been compiled from careful survey of the department's work through data sheets prepared yearly for the annual report.

Titles of student research projects of the social service department for the year 1937-38:

19 Cases of Hebephrenic Schizophrenia—A Study of Social Factors
By Helen L. Harris

A Discussion of Maternal Attitudes—Differentials in Attitudes
Toward Siblings in the Same Family
By Ann Sofman

Determinant Factors in Effecting a Discharge for 25 Children Who
Were Hospitalized for Primary Behavior Disorders
By Jean Rubin

Maternal Attitudes Found in 25 Cases of Children with Primary
Behavior Disorders
By Minna Field

A Study of the Personality and Attitudes of Mothers of Schizophrenic
Children

By Jacqueline Messer and Marguerite Rosenberg

Testing the Validity of the Rorschach Method in Determining Capacity
for Relationships

By Ada Schupper and Edith Adler

The Study of Histories of 20 Dementia Praecox Patients Treated by
Insulin Therapy

By Flaville Vogel

Projects by the following students are incomplete as of December 7,
1938; the exact titles are undetermined.

Katrina Grant, Gertrude Thomas, Shulamith Ruby,
Sylvia Lieber, Jean Ritzel

Educational Activities

During the 10 weeks from October 3 to December 10 inclusive, most of the members of the Institute staff were engaged in teaching postgraduate courses in neurology and psychiatry at the psychiatric and neurological institutes. This year 20 physicians from the State hospitals attended the course and in addition six outside physicians attended the trimester.

In addition to these teaching activities some members of the staff were engaged in giving lectures of various types to professional groups including nurses and physicians of the local board of health.

Department of Psychology

(1) In a cooperative project under the guidance of Drs. Landis, Piotrowski and Goldstein, a study has been made of the psychological changes attendant upon insulin and metrazol therapy in schizophrenia. Some ten psychological performance tests as well as the Stanford-Binet and the Rorschach procedures were given to 30 patients. Interesting relationships concerning the psychological changes were established. The outstanding discovery was isolated by Dr. M. M. Bolles who, when analyzing the material, found that three of the psychological performance tests furnished excellent prognosis for final outcome of the therapy. Dr. Piotrowski found that certain particular patterns of response on the Rorschach procedure were likewise of prognostic importance. The details of these two findings were published in the *PSYCHIATRIC QUARTERLY* for October, 1938. Since these findings were established on a relatively small group of cases it was felt immediately desirable to confirm the finding on as large a group as possible. To this end most of the patients receiving insulin or metrazol therapy at the Brooklyn State Hospital are being tested by these procedures.

The work on the startle pattern was brought to a close in June. This experimental program has been cast into book form and will be published early in 1939.

A statistical study of the relationship between social and environmental forces and mental disease was completed during the past year and appeared in a book entitled *Modern Society and Mental Disease*, published in September.

The work on the psychosexual development of normal and abnormal individuals is being written up and will probably appear in book form in the fall of 1939.

Dr. and Mrs. John Lynn of Stamford Hall have worked in collaboration with the members of the departments of psychology and psychiatry on a study of the relationship between involuntary emotional expressiveness and personality trends associated with stability, aggressiveness and activity. They previously found that individuals showing a high degree of relationship between sidedness of facial expression and handedness tended to be aggressive and active, while individuals showing a discrepancy between facedness and handedness tend to be passive and submissive. This experiment represents an attempt at the establishment of indices of a physical nature which may be used in a more adequate description of personality.

The research project in genetics that was initiated in 1937 by Dr. Franz Kallmann has been continued with the aid of all the New York State mental hospitals and tuberculosis sanatoria. This study aims, through the investigation of an unselected series of psychotic and tuberculous twins and their families, to enlarge our knowledge of the existence and effect of heredoconstitutional factors involved in the pathogenesis of endogenous psychoses and their biological relationship to tuberculosis. It has been possible to accumulate representative twin and family material, including thus far 376 psychotic and 74 tuberculous twin patients, their diseased or non-diseased twin brothers and sisters, their other siblings, their parents and the collateral lines; altogether about 5,000 individuals, the majority of whom have already been studied carefully with respect to the incidence of mental and physical abnormalities and other genetic problems. Although definite results will be available only after the final statistical and clinical evaluation of the total mate-

rial, the study of schizophrenic twins, at least, has already been sufficiently advanced to offer substantial confirmation and supplementation of Dr. Kallmann's theories on the genetic basis of schizophrenia and the important influence of constitutional factors on the onset, symptomatology and clinical course of the disease, as published in his recent monograph, *The Genetics of Schizophrenia*. The comparison of identical and nonidentical twins as well as of twins with similar or dissimilar constitutional social or dispositional conditions seems to give a new approach to the aspects of the biological components of mental disease, since definite differences in the constitutional makeup have been found in nonidentical and discordant pairs of twins, whether in similar or dissimilar life situations.

Department of Internal Medicine

The department of internal medicine in cooperation with the department of clinical psychiatry has continued the study of the effect of insulin hypoglycemic shock therapy in the psychoses. Besides observing the therapeutic effects of this treatment a number of special studies have been or are still being carried out. These are as follows:

(1) A study of the relationship of the coma dose of insulin required for treatment to the sensitivity of the blood sugar level to the intravenous injection of small doses of insulin calculated on the basis of body weight.

(2) A study of the effect of a course of insulin treatment on potassium metabolism. This inorganic constituent is of special importance because of its relationship to carbohydrate metabolism and certain neuroendocrine mechanisms.

(3) A study is also being made regarding prognostic aids as to the therapeutic effects both of insulin and metrazol treatment. The results obtained thus far appear rather promising. The study is still under way.

A number of the studies carried out thus far were reported at the interhospital conferences held in April at the Psychiatric Institute and Hospital and at the Marcy State Hospital. These were as follows:

(a) Further metabolic studies regarding the effect of insulin hypoglycemic therapy in mental patients. By M. M. Harris, J. R. Blalock and Wm. A. Horwitz.

(b) Studies in parotid secretion of patients before, during and after insulin hypoglycemic therapy. By E. I. Strongin, L. E. Hinsie and M. M. Harris.

(c) Occurrence of relapses in patients treated with insulin hypoglycemic shock. By Wm. A. Horwitz, J. R. Blalock and M. M. Harris.

(d) Protracted comas occurring during insulin hypoglycemic therapy. By Wm. A. Horwitz, J. R. Blalock and M. M. Harris.

The above papers have all appeared in print.

Convulsant Therapy with Metrazol: A study is being made of the therapeutic effect of metrazol convulsions in patients who have failed to respond to hypoglycemic treatment with insulin.

The therapeutic effect of convulsant therapy with metrazol in cases of depression is being investigated. The results obtained thus far with this treatment have been most encouraging.

Endocrine Studies: Because of the report that the administration of adrenal cortex had a favorable effect in some children with hypogonadal development and mental retardation, Dr. Harris prepared some special cortical extracts for oral administration and studied its effects in a Mongolian idiot 14 months of age and also in a child five years of age with retarded mental and physical development. There appeared to be a marked improvement in the physical condition of the Mongolian idiot although as yet no gross change has been noted in the mental condition. No effect was noted in the other child. The study of adrenal cortical therapy is being continued.

Dr. Harris has been interested for a number of years in metabolic and therapeutic studies of progressive muscular dystrophy. During the last half-year he has undertaken to study these cases from the endocrine standpoint. Dr. Barrera has agreed to collaborate in this study. Although these studies are in the preliminary stage still some interesting observations have already been made. It is hoped that it will be possible to expand this study.

The department of internal medicine has been interested for sev-

eral years in the relation of the endocrine system to mental and physical disorders and a number of studies upon this subject have been published in the past few years in collaboration with the departments of chemistry and clinical psychiatry. Because of the interesting but little understood phenomenon of the occurrence of amenorrhea in the psychoses a study is being made of the daily excretion of pregnandiol glycuronate in mental patients with and without such menstrual disturbances. It is hoped that these studies will give some information regarding the cycles of ovarian function in relation to mental disturbances. It is planned to extend this study to some of the other hormones related to the sex cycle.

It has been claimed by some investigators that agitated patients have increased amounts of ammonia in the spinal fluid. The liberation by the nervous tissue of ammonia from nitrogenous compounds presents an important physiological problem. Dr. Harris has undertaken to investigate further this problem and is extending it to a study of the presence of ammonia in other body fluids. A special ultra micromethod for ammonia determination has been worked up and is now being used in this study. It has been found thus far that certain substances are present in the spinal fluid from which ammonia may be readily split off. The relation of the presence of ammonia to such substances and its possible correlation with pathological processes is being studied.

It has been observed that certain patients have a rather low level of urea in the blood. This has led the department of internal medicine to undertake the quantitative determination of arginase in the blood. This enzyme is of great interest because of its role in urea and protein metabolism in the body. The claims that there is a sex difference in the amount of this enzyme in the blood and also that the amount changes with puberty obviously opens up a number of interesting clinical problems which Dr. Harris is planning to investigate.

The department of internal medicine is continuing to cooperate with Drs. Strongin and Hinsie in the study of parotid secretion.

Department of Bacteriology

The department of bacteriology has continued during the past year its intensive study of anaphylaxis in the monkey. The follow-

ing characteristic reactions demonstrated by this laboratory for the first time included active sensitization and shock, desensitization, passive transfer, Arthus phenomenon, functional and pathologic changes. The latter included delayed clotting time of blood, striking reduction in number of blood platelets, hemorrhagic skin manifestations, and variable pathologic findings which comprised combinations of emphysema or hemorrhage of the lungs, edema and hemorrhage of the intestinal tract, as well as occasional hemorrhage in other organs. The Schultz-Dale test for smooth muscle contraction using uterine and intestinal strips gave negative results. The latter finding is of significance since it serves to differentiate anaphylaxis in the monkey from anaphylaxis in the guinea pig where a positive Schultz-Dale test can be readily demonstrated.

Specific anaphylactic reactions have been produced with several antigens, namely, egg-white, horse serum and rabbit serum. In the above investigation we have received material aid and assistance from the bureau of research laboratories of the New York City board of health. The results are now in press and will appear shortly in two papers to be published in the *Journal of Immunology*.

In a study of the influence of the startle pattern on immune reactions in experimental animals carried out with Dr. Jule Eisenbud the use of extremely violent stimuli failed to appreciably influence immune reactions. This does not mean necessarily that stimuli of lesser intensity might not have yielded positive results. A further study of this mechanism may be undertaken in the near future.

A serologic study of the blood of patients receiving insulin treatment has been begun with a view to determining whether or not antibodies to insulin are formed in the patients undergoing this form of therapy. Skin tests for sensitivity are also being carried out.

Department of Biological Chemistry

The personnel of the department is as follows: Dr. Warren M. Sperry, research associate; Dr. Richard J. Block, research assistant. Dr. Sperry joined the staff on July 1, 1938. In addition, the department has been fortunate in having the voluntary services of

Dr. Heinrich Waelsch, formerly privatdocent in biochemistry at the German University of Prague, Miss Diana Bolling and Miss Sonia Cohen (part time) and of Dr. Albert A. Kondritzer, whose work (Investigation No. 5) is supported by special funds.

The following problems are under investigation at the present time:

1. A study of lipid metabolism in the brain with the aid of deuterium as an indicator is being carried out by Dr. Waelsch and Mr. Stoyanoff. Exceedingly sensitive micromethods by means of which it is possible to trace fatty substances in their metabolism in the animal organism have been worked out by Dr. Schoenheimer and his colleagues, with whose cooperation the procedures are being applied to various problems of brain lipid biochemistry. Although the final arrangements have not been made it seems certain that the scope of this investigation will be greatly enhanced through collaboration with Dr. Abner Wolf of the department of pathology and neurology of the College of Physicians and Surgeons, Columbia University. Funds, promised by the Friedsam Foundation for this cooperative research, will be applied to the support of Dr. Waelsch and to the purchase of special apparatus.

2. A study of cholesterol in the blood serum of patients with mental disease has been started in collaboration with Drs. Barrera and Harris. Serum cholesterol is being determined by an accurate method at intervals of four weeks in patients who are expected to remain in the hospital for long periods of time. The main purpose of the investigation is to establish the range of variation of total and free cholesterol of the serum in various mental diseases and in individuals over long periods of time. As the variations in health are large it is anticipated that it will be necessary to continue this study for at least two years before enough data will have accumulated to justify statistical interpretation.

3. An investigation of the cholesterol content of approximately twenty areas and structures of cat brain, carried out on thin slices, has indicated that large differences exist. However, it is not yet possible to give a final interpretation to the results because of the recent unexpected finding that tissue slices take up water very rapidly from isotonic saline, in which they were suspended for

varying intervals before weighing in this work. The investigation will be continued with a procedure which has been devised to avoid this source of error.

4. The difficulty just mentioned has necessitated a study of the water exchange of tissues. Rat liver is being employed because it has a fairly uniform water content throughout and permits a large number of experiments on a single liver. It has been found that no appreciable change in the water content occurs over long periods of time if the tissue is kept in an atmosphere saturated with water vapor. Under such conditions the tissues may be sliced readily without the otherwise essential wetting of the razor blade. The apparatus devised for this purpose will be used in Investigation 3.

5. Dr. Kondritzer is investigating the effects of insulin and metrazol therapy on the solubility precipitation patterns of the serum proteins. This type of fractionation permits a very precise evaluation of the changes which occur in the serum proteins. The work is being carried out in collaboration with Dr. Barrera.

6. Dr. Block and Miss Diana Bolling have developed an improved method for the determination of phenylalanine. The quantitative estimation of this amino acid will permit the formulation of diets containing known amounts of phenylalanine which are to be used in a cooperative study with the department of neuropathology on phenylpyruvic oligophrenia. Investigations on the phenylalanine content of serum and red cells obtained from normal individuals and those with phenylpyruvic oligophrenia are in progress.

7. At the suggestion of Prof. H. T. Clarke, the chemical reactions involved in the determination of phenylalanine are being investigated. This has necessitated the synthesis of the six possible dinitrobenzoic acids.

8. A method has been developed for preparing the soluble nucleoproteins of the brain. The greatest portion of the nucleoproteins so obtained, appears to be a homogenous substance containing approximately equal proportions of protein and lipid material. Immunological studies on the species specificity of brain nucleoproteins prepared from different animals is in progress. Tests will be made on both the brain lipid-nucleoprotein and on the nucleoprotein after removal of the extractable lipids.

9. A continuation of our earlier studies on the amino acid composition of the brain proteins is in progress. Methods are being developed for the determination of the dicarboxylic amino acids.

10. Comparative biochemical studies have been carried out on neurokeratins prepared by various methods from different animals. The amino acid composition of a number of keratins has indicated that this class of proteins may be divided into two main groups which have been called eukeratins and pseudokeratins. The indigestible proteins of the central nervous system (neurokeratin) appear to belong to the latter group.

Miss C. Howe, department of biological chemistry, Columbia University, Dr. A. Pappenheimer, Jr., Massachusetts department of health, Boston, Mass., and Dr. Eliot Beach, Children's Fund of Michigan, Detroit, Mich., have spent several days in the laboratory to learn methods for the determination of amino acids.

Dr. Block has published a book on *The Determination of the Amino Acids*. Dr. Sperry and Dr. Block presented papers before the American Society of Biological Chemists, Baltimore, Md., and the American Chemical Society, Milwaukee, Wis.

Department of Neuropathology

During the year reported herein, the department of neuropathology has been interested in investigations related to the following problems:

1. Pathological changes following insulin therapy: A thorough pathological investigation is being prepared for report on the findings in five cases of schizophrenia following insulin therapy. The material has been available through the cooperation of various State hospitals.

The investigations, up to the present time, seem to have established two main points: (1) There are diffuse degenerative changes of the nerve cells extending to most of the cortical areas with predilection for the temporal and occipital lobes. These degenerative changes consist in the rarefaction of cells and in the most severe cases large areas of cellular devastation are found with various types of reaction on the part of the neuroglia; (2) A typical process of productive endarteritis characterized by proliferative changes of the blood vessels, particularly of the small ones, stands

out in most of the devastated areas. It is thought that the pathological brain lesions following insulin therapy might result from both anoxemia determined chemically through insulin and from the morphological changes of the vascular system.

2. Alcoholism: Material has been collected also from various State hospitals in order to investigate the pathological changes in acute and chronic alcoholism. Special attention is being paid to the correlation existing between the pathological features of alcoholism and the so-called Wernicke hemorrhagic polioencephalitis.

3. Study on brain lipoids: This experimental investigation centers around the action of phosphatides and cerebrosides over the central nervous system. In view of the fact that in certain cases of Tay-Sachs' disease accumulation of sphingomyelin has been reported in the nerve cells of the brain, it was thought that repeated intravenous injections of sphingomyelin might lead, in animals, to the experimental reproduction of the pathological findings of Tay-Sachs' disease. Up to the present time, it has been possible to reproduce in rabbits lesions which are similar to the ones reported in Niemann-Pick's disease and more precisely, appearance of foam cells in the liver, spleen and bone marrow of the animal. In other animals, which are being injected daily with sphingomyelin, it is hoped to reproduce pathological lesions in the brain itself, thus establishing experimentally the alleged relationship between Tay-Sachs' disease and Niemann-Pick's disease. Kerasin is also being accumulated in the course of the last 18 months for the purpose of reproducing experimentally lesions of Gaucher disease.

4. Experimental encephalopathy in monkeys: Following the report of Rivers that in monkeys an acute encephalomyelitis develops as a result of repeated intramuscular injections of rabbit brain extract, the department of neuropathology has been investigating this problem for the last 18 months, during which time several monkeys have been subjected for periods of a few months to over a year to intramuscular injections of this extract.

It has been possible to produce with this method a pathological process of the brain which is being investigated at the present time in order to establish its relationship to various types of demye-

linating diseases particularly with the so-called acute multiple sclerosis. A further step in this investigation would consist in establishing, if possible, what part of the rabbit brain extract is responsible for the changes and compare the changes with one resulting from the intramuscular injections of lecithinase which might be important in the determination of the pathological lesions.

5. Following already published investigation on the action of certain amines over the central nervous system, experiments are being carried on at present in order to investigate in cats the influence of tyramine injected over long periods of time. The association of small doses of various amines is also being tried.

6. Change of the vascular pattern of the central nervous system following experimental trauma is being investigated with the view in mind of establishing the early vascular changes and their relationship to brain pathology in trauma.

7. Experimental lesions on rabbits' and cats' brains are being produced with a view in mind of investigating the reaction of the central nervous tissue to certain types of brain injuries; the reaction of the microglia and oligodendroglia are particularly taken into consideration.

8. A new case of Pick's disease which was diagnosed in life by Drs. Goldstein and Katz is being prepared for pathological report.

9. Vestibular and cerebellar function. Experiments which have been carried on for a number of years are being continued in order to establish the clinical differential features between cerebellar and vestibular functions. The material is also used to investigate specific anatomical problems such as the relationship of the inferior olive, the nucleus lateralis, medulla, and the nucleus of Clark-Monakow to various areas of the cerebellum.

We are thus taking advantage of the numerous opportunities to study not only mental disorders as such, but the way in which the various tissues of the body function normally and pathologically where they may form the setting of a serious behavior deviation. By investigating the basic chemistry and structure of the body, by observing the problems of child psychiatry where unevenness of development and early conflicts are presented to the physician, by

the analysis of the phenomena available in the psychosis and the social pathology of adult life with special techniques and methods, and by training others in the scientific disciplines, we attempt to make progress year by year in a field in which important discoveries must be just ahead.

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POSTEMOTIVE SCHIZOPHRENIA

BY POMPEO MILICI, M. D.

All manner of biopsychic manifestations are elicited by emotional stresses and the individual reveals himself in the mode of his reactions to them.

As might be expected, situations actually or threateningly inimical to the bodily self, which stir up strongly the powerful instinct of self-preservation, particularly make demands upon emotional responsiveness. These are met with varying degrees of adequacy by different individuals.

During cataclysmic events such as destructive earthquakes, floods, explosions, conflagrations, shipwrecks, train collisions, large numbers of persons are subjected to threats of injury or death. All suffer emotionally the horror of the spectacle and the extreme danger which confronts them. Many will show exaggerated reactions of fight or flight. Even the most well balanced may undergo a transient failure of the highest psychic sphere, become stuporous, blindly impulsive or show automatic behavior. Others will suffer temporary psychoses, often ushered in with a stuporous state passing through a state of asthenic, bewildered confusion, with difficultly controlled anxiety, fear and apprehension, disorientation with amnesia, delirious outbreaks and slow convalescence.

Most of such postemotive reactions eventually and spontaneously disappear almost completely, if not completely, and are in general regarded as essentially self-limited syndromes. Nevertheless, the occasional individual, constitutionally predisposed and thoroughly overwhelmed, will acutely or subacutely, after a latent period of apparent normality, show serious psychotic disorder.

In the cataclysmic circumstances above mentioned, conditions are excellent for the production of maximum psychic shock. But the situation need not be so complicated and single threats alone may be productive of psychic disintegration. Accidents, with or without physical injury, threats through illness, real or imagined, or through surgical operations, are reacted to in an exaggerated manner by some individuals. The psychoses which follow closely upon the extraction of teeth and upon nose and throat and other minor surgical procedures, in which local anesthesia is used seem

to be largely dependent upon the associated emotional trauma. It is significant that major operations, with sedative preparation of the patient and the use of general anesthesia, do not so commonly lead to psychotic disorders.

Case 1. R. P. was born to Italian parents in Brooklyn, N. Y., in April, 1911. Birth was normal and of the childhood diseases she suffered only a mild attack of measles. When she was seven her alcoholic father died and for the following four years she and six siblings were cared for in an institution. They returned home when the mother remarried. At 15 years R. P., an average student, left school, eagerly sought employment and soon found work in a candy factory where she applied herself energetically and where, despite her obviously shut-in personality, she appeared to be happily adjusted.

Psychosis: In January, 1932, her right arm was caught in a machine pulley belt and, though the muscular contusions she sustained healed with two weeks of hospitalization, she was unable to return to work until two months later because of the "nervous state caused by the accident." At the factory, then, "emotionally anaphylactic" to the dangers of machine work, she did poorly and was sent home several times with the advice that she needed a longer rest.

Late in March, 1932, she went home from the factory "trembling all over." She was unable to sleep, was hypochondriacal, had crying spells, appeared to be generally apprehensive and suffered acute fear reactions. She resented all interferences with her activities, frequently with marked outbreaks of temper.

Shortly she neglected her personal appearance and habits and otherwise showed widespread retraction of interests. Absorbed, she laughed to herself often and talked senselessly in a childish voice.

It was noted at this time that her eyes were becoming prominent and her appetite voracious despite which fact her weight dropped quickly from 110 pounds to 72 pounds. She was hospitalized on the advice of a physician in order to receive treatment for "goiter," but was sent home after several days with the statement that nothing could be done for her. Her commitment then became necessary.

She was admitted to Kings Park State Hospital, July 8, 1932. At physical examination there were noted moderate exophthalmos and slight bilateral soft enlargement of the thyroid. However the pulse rate was normal and there was absence of pathological tremors.

She cooperated poorly for mental examinations, and was so markedly absorbed during the greater part of the time that her attention was gained only with much difficulty and little relevant information was directly obtainable. At times she talked with babyish vocabulary and intonations and occasionally produced an unintelligible word salad—but otherwise spontaneous productions were absent. Extremely listless, she stared fixedly with silly, vacant looks and except for rather frequent fear reactions, seemed emotionally rigid.

The sensorium was clouded, with disorientation for place and time and complete amnesia for the accidental injury to her arm which now showed practically no residuals of injury. A diagnosis of dementia præcox, hebephrenic type, was made in her case.

To date the patient has continued in a state of advanced hebephrenic deterioration. Idle, seclusive, very much absorbed, she chuckles and exhibits a silly smile all day long. At times she is rigid, with fixed staring facial expression, maintaining constrained and awkward attitudes for varying periods. At other times she is excited, impulsive and destructive. Rarely are questions answered and then only after considerable blocking, in a markedly illogical, unclear and contradictory manner so that it is impossible to hold even a simple conversation with her. Her childish affected method of speech continues and her entire behavior is on a far regressed level.

Case 2. D. F. was born in Brooklyn, N. Y., in May, 1901, of Irish parents. The family history is "negative." An average student, he was graduated from elementary school at 14 years. For a time he worked as a delivery clerk and then for a railroad company in one of their branch power houses where he elevated himself to the position of substation operator, assuming complete responsibility of an eight-hour watch. For seven years he worked efficiently and steadily with only one day a month off duty.

Psychosis: One night, while alone at the power house, a fuse blew out, badly frightening him. He left his job at once, and at home explained that the engines were "on his nerves" and that "you can never tell when one will blow up." For the following two years he remained almost entirely within the home and showed a morbid interest in his physical well-being. He left his home only to seek medical advice and he spent much of his time reading articles by physicians. His appetite became poor, he lost weight, and sat about for hours with his eyes partly shut. Later he developed the idea that people were against him. He became increasingly irritable and threatening, then mute and inactive, and his commitment followed.

Upon admission to this hospital September 21, 1932, he was poorly cooperative, sullen, surly, reticent and evasive. His productions were irrelevant and incoherent and revealed ideas of reference and persecution with supporting auditory hallucinations. Silly at times, markedly excited and assaultive at others, for the most part he stared in a bewildered, perplexed manner and made many mumbled references to funerals and death, to burials of himself and of his parents. His illness was diagnosed dementia præcox, hebephrenic type.

Thus far there has occurred very little change in his condition. Seclusive, absorbed, he sits in crouched postures, fumbling constantly with his fingers, chuckling and laughing. His eyes stare and there are marked tremors of the lids. He is virtually inaccessible and replies only occasionally, in monosyllables and irrelevantly.

Case 3. G. M. was born in New York during January, 1900, of Irish parents. He graduated from high school, after which he was employed as a switchboard operator in a power house. He is said to have been of schizoid makeup but fairly well adjusted.

Psychosis: In 1927, a short-circuited cable dropped across his arm, badly frightening him and burning him severely. He recovered from his burns after five weeks in a hospital but he has held no gainful occupation since, and has demonstrated subsequently an abnormal fear of electrical apparatus of all types.

He became increasingly seclusive, excitable and restless. There were frequent periods when he was worried, despondent and had attacks of weeping. Often he appeared to be markedly confused with

considerable defect in memory. He expressed delusional ideas of persecution, and was committed after attacking an uncle savagely.

On admission to Kings Park State Hospital June 15, 1932, he was confused, excited and assaultive. For a time he continued totally uncooperative and difficult to control. Later he volunteered, "I have disability in arm. Bad wound in arm. That is the only trouble I have been in." Questioned as to this "wound," he repeatedly replied, "I don't remember, it's so long ago." His further replies were evasive, contradictory and irrelevant, but revealed ideas of reference and persecution and auditory hallucinations.

The diagnosis in this case is dementia præcox, paranoid type. The patient thus far has shown no essential improvement. He is disoriented for time and place and his memory is poor. He is idle, seclusive, absorbed, incoherent in his conversation, offering absurdities and irrelevancies. He is often irritable, surly, negativistic and assaultive. He misidentifies freely and continues to hallucinate.

Case 4: V. W. was born in Brooklyn, N. Y., in November, 1900, of Irish parentage. Two sisters and a paternal aunt are psychotic. She was a healthy, robust child but was pampered to excess, especially by her father to whom she was overly attached. She became vain, proud and domineering. After completing two years of high school, she worked for a short time as a cloak model. Subsequently, being particularly interested in drawing and painting, she worked at painting novelties. Stubborn, hypersensitive, egocentric and conceited, she could not get along with people and as a consequence, held her positions for only short intervals.

Psychosis: In 1927, she was struck by an automobile. Physical injuries were negligible although she was dragged for a considerable distance. However, she at once "became extremely hysterical and remained so for several weeks." Immediately following this, she was more argumentative, quarrelsome and domineering. She now made many unreasonable demands upon her family, insisted that all about her accede at once to her every whim. She worked spasmodically, with gradually decreasing interest, and after two years no longer sought employment. She showed increasing interest in psychology and philosophy, attended lectures and

read many books on these subjects. She began then to keep very much to herself, leaving the house rarely and then only with a sister, so that she soon lost her small circle of girl friends. She was now extremely introspective, became more and more careless of her personal appearance and attempted to apply psychological principles to everything about her.

Deterioration progressed, uncovering still further her antagonistic tendencies and strongly ingrained stubbornness. She began to act queerly, rearranged the furnishings in the home again and again and insisted on turning the rugs upside down. She commenced to have spells of excited, overactive, overtalkative behavior. She complained of dyspnoea, of pain and blindness in one eye, and she looked at herself in mirrors for hours on end. She said that she could read people's minds, that everyone was against her. On the streets she would often turn around dozens of times to see if she was being observed. Worried, depressed, unable to concentrate, she made a half-hearted suicidal attempt which precipitated her commitment.

She was admitted to this hospital April 6, 1932. Here her case has been diagnosed dementia præcox, paranoid type. She is very seclusive, apathetic, absorbed and silly. Uncooperative, she attempts constantly to hide herself and becomes resistive, irritable, abusive and assaultive when sought out. She says that she does not want to live in reality, but to escape reality, and that she wants to lie in bed all day and take things easy. She admits continuous hallucinations, smiles and talks to herself, and in a condescending manner and rambling trend, reveals a wealth of unsystematized delusions of a paranoid nature. She says, with a self-satisfied smile, that the automobile accident brought on her illness and that she now has heart trouble. She decorates herself with bits of string, walks back and forth, imitating the mannerisms of a cloak model.

Case 5. J. W. was born in Brooklyn, during October, 1901, of English parentage. Following his graduation from public school he worked as a plumber's helper and, while his personality was strongly schizoid he is said to have been well adjusted.

Psychosis: In 1929, while working in a manhole, he was badly frightened but otherwise uninjured by an explosion underground. He left his job at once, made no attempt to seek another, underwent

a gradual diminution of interests and began then to behave peculiarly. Extremely reticent, he generally refused to answer questions, went about ringing people's doorbells and mumbling to himself. His commitment followed a suicidal attempt.

At Kings Park State Hospital where he was admitted July 25, 1934, the diagnosis was dementia præcox, hebephrenic type. The patient continues to evidence gross deterioration. He is dull, indifferent, stubborn, resistive, reticent and evasive. Questions have to be repeated many times and answers are brief, half mumbled, irrelevant, and often a stereotyped "I don't know." In a dreamy, silly way, he smiles and talks to himself disconnectedly and while he admits the presence of auditory hallucinations, he will reveal nothing of their content. Preoccupation continues to impair his orientation, memory and ability to concentrate.

Serious mental disequilibrium may follow emotional shock, traumatic in a social sense. The loss of a loved one by death under either normal or dramatic circumstances, the loss of a lover by desertion, an assault or violation, marital maladjustment, the birth of an unwanted child, irreparable physical deformity, bad news, failure in a business venture, these and many other social stresses, singly or in combination, are capable of precipitating psychotic manifestations.

Case 6. J. T. was born in Brooklyn in February, 1901, of Irish parents. The family history is negative. He had a partial public school education after which he worked as a laborer. He married at the age of 24 and showed chief interest in his home and children, of whom he had four. He was described as seclusive, reticent, given to brooding and overly stubborn.

Psychosis: In late July, 1933, the patient's father-in-law died of cancer of the throat. His father had also died of cancer and the patient was abnormally upset, very soon insisted that he too had cancer and turned to religious trends. Shortly he insisted that everyone was against him and watching him continually. He believed that his wife was attempting to poison him and he refused to eat. He complained of "too many crosses to bear." In reaction to voices he struck his daughter and attempted to choke his wife; he was therefore committed.

Admitted to Kings Park State Hospital September 28, 1933, he was sullen and uncommunicative, with delusions of persecution involving his wife. He said that after his father-in-law died he felt buzzing in his ears and believed that either he or his own father was trying to communicate with him. In a depressed, perplexed state he talked slowly of unjust persecutions, incriminating voices and a fear of death by cancer. He breathed often in a stertorous manner as though suffering a laryngeal stricture and kept his throat encircled with both hands for hours at a time, often repeating "my wife wants me to die like my father and her father."

The patient is now in a state of advanced deterioration. He is seclusive, sullen, absorbed and negativistic. Silly smiles are frequently in evidence. Whatever answers are given, are brief and in a low voice but as a rule questions have to be repeated again and again and are unanswered. Diagnosis in this case is dementia præcox, paranoid type.

Case 7. P. S. was born in New York City in April, 1897, of German parents. The family history is negative for nervous or mental disease. After graduating from public school she took a business course, worked as a stenographer for three years and subsequently as a nursemaid and governess. She was seclusive, depressive, worrisome, but conscientious and efficient in her work and she spent a good deal of effort studying the proper care of children.

Psychosis: In October, 1925, the patient's mother, to whom she was deeply attached, fell three stories to her death. Long after the immediate shock the patient continued to hear, in retrospect, her mother's screams, to visualize her falling through space and huddled on the pavement and to relive the very emotions she experienced at the time she witnessed the actual fall. She worked intermittently for two years but gradually lost interest, became inefficient, then restless, agitated and depressed. She had many hypochondriacal ideas, expressed hopelessness of outlook and became increasingly seclusive and given to "hysterical" outbreaks.

The patient was admitted August 6, 1929 to Kings Park State Hospital. The diagnosis is dementia præcox, catatonic type. The physical examination is negative except for male distribution of hair. She has a dull, vacant expression but is often dejected and says she feels so despondent that she would welcome suicide if she

did not "lack the courage." Memories of the terrible day of her mother's death are still so clear and vivid that it seems to her exactly as if she sees and hears her mother. Her sleep is disturbed by related nightmares. For the events immediately following the accident she has marked amnesia and many memory gaps are otherwise noted. Very submissive and without initiative she says that she has not been able to pull herself together. She keeps herself secluded as much as possible, likes to sit in dark corners, complains frequently of headaches and nausea, says that her mind is a blank and oftentimes she appears confused and retarded almost to the point of stupor.

Case 8. M. F. was born in New York City in February, 1912, of alcoholic Irish parents. Her mother died at birth of patient. There were no peculiarities of note during the early developmental periods. After one year in high school she worked efficiently as a telephone operator for 10 years.

Psychosis: In February, 1935, the patient's father fractured his skull in a fall downstairs and died almost at once. The patient, summoned from her vacation, was overcome with grief, "became hysterical and for 18 days did not sleep or eat." She talked of her father constantly, said she continued to see and hear him. Then, very depressed and agitated, confused and hypochondriacal and with ideas of reference and unsystematized delusions of a persecutory nature, she was committed.

On March 10, 1935, she was admitted to this hospital. The diagnosis is dementia praecox, hebephrenic type. She is almost entirely inaccessible, mutters to herself in an unintelligible way, occasionally whispers parts of sentences, rarely replies relevantly and often screams loudly. She is markedly confused and silly, has bizarre mannerisms and reacts to hallucinations.

Case 9. A. M. was born in Russia in September, 1891, of Hebrew parents with negative family history. After coming to the United States at the age of three she attended public school until 14 and then worked steadily in a tailor shop. She married at 21 years but her husband was shiftless, deserted her within a year and she divorced him gladly, continuing thereafter at her employment.

Psychosis: In 1926 "she had a severe nervous shock" when she saw her three-year-old nephew burn to death before her eyes.

Shortly she had periods when she would laugh without apparent reason. Then she seemed much depressed, cried a great deal and showed increasing absorption, mutism and lack of interest in what went on about her. Occasionally she alluded to visual and auditory hallucinations. She was able, however, to continue at her work for one year, when she started to express marked delusions of reference and persecution. These and the associated outbursts caused her to lose her job. She refused now to leave her home and to bathe or otherwise attend to her personal needs. Because of ideas of food poisoning it was with difficulty that she could be made to eat at all.

A diagnosis of dementia præcox, paranoid type was made in this case after admission, February 25, 1928, to Kings Park State Hospital. She continues idle, seclusive, absorbed and wanders aimlessly about in a very apathetic way. She is rambling, incoherent, irrelevant and often fragmentary in her productions. She is disoriented for time and place and has a marked impairment of memory. Often she requires to be spoon fed and she wets and soils. In reaction to voices she is at times very silly, at other times irritable and impulsively assaultive.

Case 10. G. R. was born in Brooklyn, N. Y., in December, 1911, of Hebrew parents. The family history is negative. After graduating from public school she attended a business college and for eight years subsequently was employed in one office as a stenographer-secretary.

In 1934 she showed more than a passing interest in a young man, kept company with him for several months and became formally engaged to him. "He was a perfect gentleman and never forced sexual attention on me." He wanted very much to marry but she could not decide on this. She liked him but did not "love" him and finally gave him up when he lost his job.

Psychosis: In November, 1935, she returned home from work in an excited state and remarked that a man in the office had approached her sexually. She did not return to her job and at home continued under considerable emotional tension. At night she would often awake screaming. Repeatedly she went to nearby hospitals insisting that she was pregnant and demanding that an abortion be performed. She developed the idea that she smelled like a

horse and said she was different from other people. She then became withdrawn, dazed and confused and her commitment followed a suicidal attempt.

On admission to this hospital, December 14, 1935, the physical examination made note of a slight exophthalmos and of a peculiar disposition of fat about the pelvis. She was so profoundly preoccupied as to be grossly out of contact with reality. Later her scattered remarks were chiefly monosyllabic, her thoughts coming in a slow, labored fashion without any play of facial expression or emotional tone whatsoever. The only positive statements that could be obtained were assertions that she was definitely certain of her pregnancy, that she could feel life in her abdomen despite the fact that she had not had sexual relations and that she wanted an abortion performed as soon as possible.

To date no remarkable change has been noted in this patient's condition, which has been diagnosed dementia præcox, hebephrenic type. Dull, dazed, confused, she wanders about aimlessly, looking at the walls, trying all the doors, mumbling to herself over and over that she is pregnant and that she wants an abortion to maintain her respectability. She becomes disturbed when contradicted but otherwise it is impossible to establish any contact with her, the idea of pregnancy predominating to the total exclusion of other ideas. Silly chuckles occasionally replace her dull, vacant, or confused expression. She requires nursing attention for every detail except meals when she feeds herself and eats ravenously.

Case 11. G. B. was born in New York City in December, 1908, of Irish parents. The family history is negative. She graduated from public school at 13, remained at home for a few years, then worked as a telephone operator. She married when 19 after an eight-month courtship and has two children. Married life is said to have been happy.

Psychosis: The onset was abrupt following an argument and loss of friendship with a neighboring woman. The patient became "hysterical," collapsed and fainted. At once she felt that all the neighbors were talking about her and she began to indulge in religious practices to an extreme. Since she continued the idea that the neighbors were against her, the husband changed their residence. The patient seemed to be temporarily appeased but again

insisted that people were talking about her and revealed that she heard derogatory voices. As a consequence, the family moved several times; each time the patient would be only temporarily benefited. She then started to point out passing automobiles as containing spying people and she would hide herself when visited. She insisted that her neighbors were administering poison to her in her food. She prowled about the house at night, wakened her husband often, made attempts to run away, then suddenly became entirely mute.

At Kings Park State Hospital where she was admitted December 2, 1934, she was stuporous for several weeks. Then, confused and hallucinated, she paid no attention to questions but talked repeatedly of persecution and poisoning. After a time she cooperated fairly well for interviews. She stated that she had passed through a period in which she was unclear and admitted the falsity of her ideas. She said that her trouble had started when her neighbor made comments derogatory to her. Because of this, she said, she became immediately ill at ease and developed many peculiar ideas, silly products of her imagination. She expressed a strong desire to recover and to return to her husband and children. The improvement, apparent for several weeks, did not continue and soon gave way to an increasing deterioration. The patient began to revert to states of catatonic stupor and excitement. No improvement has been noted to date. There is considerable silliness. She is irrelevant and incoherent with word-salad replies or, as is more usual, completely inaccessible.

Case 12. C. B. was born in Brooklyn in January, 1898, of Hebrew parents. The family history is negative. Birth and early development were normal. He completed grammar school at the age of 14 and worked subsequently as a clerk in a railroad office. He was of a seclusive makeup.

Psychosis: In the fall of 1929, while on an automobile trip with a male friend and two girls (seduced by C. B. and his companion), the patient fell asleep. On awakening he saw a policeman standing beside the car which had been stopped for speeding, and immediately became "hysterical," thinking that he was to be arrested for his sexual transgression. He was abnormally quiet on the return trip, then became very excited and said that the police and other

people were after him, and that he was being followed. He did not return to his employment, became increasingly seclusive, refused to associate with his family and avoided strangers entirely. He sat about the house, inactive and apathetic. Thereafter he began to accuse young people in the neighborhood of having improper relations with one another. He made improper advances toward a sister and a niece and spoke of little other than sexual intercourse. After entering upon a confused state with aimless and destructive activities, he was committed.

Upon admission to Kings Park State Hospital, August 30, 1931, he was seclusive, indifferent, evasive and hallucinated. He talked to himself and was very suspicious of every move made under his observation. He prayed a great deal and said that he had great power, that he was in communication with Marconi, that he was as great as God. The patient has made no improvement. He is seclusive, silly, irritable, resentful. In a simple, childish way he mumbles to himself and talks back to the radio. Incoherently he discusses ideas of poisoning, states that he receives messages from God and that he has ability to create flies and horses. The diagnosis is dementia præcox, hebephrenic type.

Case 13. C. Z. was born in Italy in April, 1893, of Italian parentage. His mother had a chronic psychosis. Birth and early development were normal. He entered the United States in 1905, married in 1923, is the father of three children and according to all accounts was very happy and well adjusted.

In 1931 because of business conditions, he was discharged from his employment as foreman of a lumber company, which position he had held steadily for 20 years. He brooded considerably because of this but worked at odd jobs and managed to support his family.

Psychosis: In July, 1933, he fractured a leg and his income stopped altogether. While in the hospital he became very restless and had digestive complaints which were unrelieved by medication. After leaving the hospital he visited several physicians without obtaining relief. He then began to believe that his liver, kidneys and circulation were not functioning properly and he was unable to sleep. He complained of smothering sensations and suffered frequent episodes of depression. He developed the idea that if he

remained at home his children would become infected with germs from his stomach, that they would thereupon surely die, and in November, 1933, he slashed his throat seriously with an axe in a suicidal attempt.

At this hospital, where he was admitted November 11, 1933, when asked what his trouble had been, he replied. "A broken leg." He insisted that his organs were not functioning properly and that gas in his stomach formed a poison which influenced others. He said that he had been entirely normal in every respect until the time he sustained the injury to his leg but that following this he had passed his intestines through his bladder and rectum, that he was, therefore, no longer able to digest his food, that poison was circulating in his head, causing him to "see and hear things."

The patient has continued confined in the hospital and has undergone a marked deterioration. He is silly, dull, indifferent, seclusive and uncooperative, blocks in his speech and maintains delusions of poisoning, persecution, and bodily change. The diagnosis is dementia præcox, paranoid type.

Case 14. A. G., the third of six siblings, was born in Brooklyn in June, 1915, of German parents. His birth and early development are not remarkable. The family history is negative for nervous and mental disease. A. G. had been well adjusted and when in high school demonstrated much athletic prowess, being a member of the regular football team.

Psychosis: In 1932, during a football scrimmage, he sustained a head injury. He was examined by several oculists, all of whom diagnosed double detached retina and gave a poor prognosis for vision. A. G., in a panic of uncertainty, made an attempt to study Braille. He then conceived the idea that he could cure his vision by secluding himself in total darkness, which he did for several months. Next he bound his eyes with black cloth which he would not remove for a month. He next believed that by exercising the muscles of his eyes the retinae would heal. This was followed by a period of several months when he insisted on resting the eye muscles, assuming rigid attitudes of his head. There were spells of depression with weeping, but more marked than this was an increasing seclusion, apathy and irritability. In November, 1935, he was placed under the care of a psychiatrist. His thought content

at this time abounded in manifest homosexual ruminations, and there were some vague auditory hallucinations.

In the fall of 1936 he began to insist that he was God, that he was an emperor and that others about him were members of royalty.

At Kings Park State Hospital where he was admitted March 3, 1937, he is poorly cooperative, suspicious, evasive and taciturn. At times however he reveals an amazing variety of paranoid ideas with supporting auditory hallucinations. The diagnosis is dementia præcox, paranoid type.

DISCUSSION

Susceptibility to psychosis is not alone sufficient for the development of the psychosis. Predisposition is not disease. Latent schizophrenics and manic-depressives probably outnumber, by far, those with these frank mental disorders. The former manifest more or less clearly the inadequacies in their makeup but in the absence of disruptive stresses are yet able to carry on a satisfactory social adjustment. Yet, while the external shock, when it is noted, is the prominent understandable caustive factor of the psychosis, the endogeneous structure is of the greatest etiological importance. The striking variation of individual reaction to the same stresses or to stresses of the same nature, as well as the same reactions by the identical individual to a variety of stresses, is alone sufficient to indicate the importance of individual makeup in the delimitation of the psychoses. Emotional shock, however violent, does not of itself suffice to provoke prolonged psychosis. Regardless of the intensity of the emotional disturbance the "normal" individual sooner or later regains complete "normality."

But when an individual vulnerable to psychosis does meet with an insupportable trauma, more or less well-defined psychotic manifestations are certain to follow. In these instances the influence of the emotions may not be lightly dismissed. Shock is here the precipitating factor of the psychosis, and seems alone sufficient to initiate dissociation and disequilibrium of the psyche.

Emotional situations are more frequently to be observed as precipitating causes of manic-depressive psychoses than of the schizophrenias. But while there may be an apparent absence of exciting cause, such cause is, nevertheless, usually present and ascertain-

able upon close review of the anamnesis or upon psychoanalytical study of the patient. It is noteworthy that even in cases where psychic insult was prominent, it is at times only with difficulty that the history of its occurrence is elicited, especially from the patient.

Ordinarily, then, in cases of dementia præcox, the psychic insult is not immediately uncovered. It may not be made apparent until there has been an unfolding of personal complexes, areas of psychic sensitivity which rendered the individual vulnerable to exaggerated reaction in response to emotional situations. There is then usually to be observed a close symbolic union between the precipitating agent and the underlying psychological difficulties. This makes it readily apparent that the actual precipitating situation need not have been of seemingly strong emotional power, but that it has played the part, instead, of a tiny spark in setting off a conflagration, "the complex storm."

It is the writer's opinion that the great majority of cases of dementia præcox are postemotive, that at the beginning of most schizophrenias there is an overwhelming affective situation which the individual, because of constitutional weakness, is incapable of handling adequately. Situations which threaten self-preservation, or the social self, or more especially, conflicts in the sexual life, form a frequent starting point for the flight processes of the disorder.

Dementia præcox, therefore, is an abnormal form of biological response to life situations. The psychic superstructure, the highest intentional sphere, becomes so altered, so narrowed and confused that the primitive, dormant, instinctual, ontogenetically preformed, constitutional types of reactions arise from the unconscious subsoil. They are aided, now more, now less clearly, by an outcropping of a purposeful and secondary "flight into disease," a "will to sickness," and an "advantage by illness," which assists in the fixation of the precipitated "affective reaction" and makes for prolongation of the course of the psychosis.

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INCONTINENCE IN ACUTELY PSYCHOTIC PATIENTS

A Correlation of Incontinence with the Trends, Diagnoses and the Outcome of the Illness

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Incontinence of feces is often associated with urinary or salivary incontinence. These three forms of incontinence were all observed in a 16-year-old catatonic school boy who believed he was dying or dead. His illness followed an attempt by an older married woman to seduce him. He was agitated, often wept and said: "When am I going to be dead? I used to be able to get up and walk around. I'm passing away. It's a pity the way I died when I was 16 years old—Mama, Mama, where am I? I am dying. Daddy dear!" He assumed an intrauterine posture, drooled saliva, wet and soiled himself, and practised anal masturbation. He smeared feces on his body so persistently that he had to be cleaned a dozen times a day. He cursed and struggled with those who tried to keep him clean. At times he shouted, "Mama, Mama, I want to go to the bathroom," and sometimes he excused his incontinence by saying that he was "such a young fellow and separated from his mama."

A review was made of the mental illnesses of the 366 male patients who were at some time during a period of 10 years resident in a mental hospital on the wards for disturbed patients. From this group were selected those who were incontinent of saliva, urine or feces. Incontinence of saliva was assumed to be present when the salivary secretions were promiscuously expectorated or drooled from the mouth while the patient was awake. By incontinence of urine and feces is meant that these excreta were evacuated in places other than the toilet, bed pan or urinal, whether the patient was in a waking or sleeping state.

All cases with delirium or organic disease were excluded from this study. At the time the observations were made all the patients were less than fifty years of age. There remained from the total of disturbed patients a group of 235 patients, 100 of whom were incontinent. In Table 1 is presented the frequency of continence and incontinence with respect to the formal diagnoses.

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TABLE 1. FORMAL DIAGNOSES, FUNCTIONALLY INCONTINENT AND CONTINENT

Formal diagnosis	Incontinent		Continent	
	No.	Per cent	No.	Per cent
Dementia præcox:				
Catatonic	48	48	12	9
Paranoid	11	11	30	24
Hebephrenic	3	3	2	1
Paraphrenic	0	0	2	1
Unqualified	9	9	6	4
Simplex	1	1	0	0
Paranoic condition	0	0	7	5
Manic-depressive:				
Manic	11	11	36	28
Depressed	2	2	5	4
Mixed	5	5	2	1
Circular	7	7	8	6
Involucional melancholia	0	0	6	4
Other diagnoses*	3	3	19	13
Total	100	100	135	100

*Psychosis with psychopathic personality, psychoneurosis and undiagnosed.

According to this table 72 per cent of the incontinent patients belonged to the dementia præcox group and incontinence was twice as frequent in the catatonic type as in all other types combined. Practically all of the other incontinent patients belonged to the manic-depressive group with the greatest proportion of them in the manic phase.

These observations are supported by the fact that only 9 per cent of the continent patients were catatonic, 29 per cent were paranoid and 39 per cent were manic-depressive. All of the involucional melancholia patients studied were continent.

The outcome of the illness of the incontinent patients was studied at the end of three years after the onset. The onset of the illness was routinely fixed as the time when the patient had to give up his usual work. According to the course of the illness the patients were grouped as unimproved, improved, much improved and recovered. The unimproved were in the same or a worse condition than that observed at the time of admission. The improved were better adjusted socially but still required hospital treatment. The much improved were well enough to live outside of a mental hospital but

were unable to do their usual work. The recovered were able to continue with their usual activities outside of a hospital.

Because of insufficient data the outcome of the illness could be determined in only 92 of the 100 incontinent patients and in only 117 of the 135 continent patients. The results are shown in Table 2. It appears that there is little difference in the outcome of the illness of disturbed patients so far as continence or incontinence is concerned.

TABLE 2. OUTCOME OF ILLNESS, FUNCTIONALLY, INCONTINENT AND CONTINENT, PAST THREE YEARS

	Total No.	Unimproved		Improved		Much improved		Recovered	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Incontinent	92	46	50	9	10	11	12	26	28
Continent	117	53	45	20	17	16	14	28	24

The mental trends of the incontinent patients were found to have two outstanding characteristics. An aggressive attitude toward the environment and false ideas regarding personal identity were present in 78 of the 100 patients during the period of incontinence. Of the remaining 22 patients there were 17 who were mute or so poorly in contact with the external world that their trends were not adequately recorded. The other five cases were incontinent of saliva only. It should not be concluded from this that patients showing incontinence of saliva only, do not have false ideas of personal identity and an outwardly directed aggression because there were four of such cases.

The false beliefs as to personal identity were of several types. The patients believed that they were dying or dead; that they were little children, or animals, especially dogs; or that they were very important persons. The most frequent grandiose identifications were those with God, Jesus Christ, St. Peter, kings, presidents, famous athletes, very wealthy persons, and persons of great genital vigor. The patients having false ideas as to their personal identity often acted according to their assumed roles. The "dead and dying" closed their eyes, became mute and made few physical movements. Some assumed intrauterine postures. Those who believed they were children cried, spoke in high-pitched childish voices, and gave evidence of childish desires by making such requests as to be allowed to wear diapers. Those who believed they were animals

barked like dogs and mewed like cats and the grandiose patients were haughty, condescending and boastful.

These false ideas of personal identity along with the resulting conduct were the only evidence of the so-called confusion often apparent in disturbed patients, especially those with catatonic dementia praecox. Genuine lack of orientation for time, place and other people was found in a small proportion of the cases, during the early part of the hospital residence and while the patients were still dehydrated, and toxic from narcotic drugs and poor elimination. After more normal metabolic processes were restored this disorientation was no longer present.

The outward turning of the patient's aggression which accompanied incontinence was manifested by talk and behavior. The aggressive talk was of a loud, sarcastic, vulgar or blasphemous nature. The acts of aggression were shown by destruction of clothing or hospital property and by the injury of other persons through biting, kicking, striking or choking them, throwing hard objects at them or by viciously grabbing their genitals.

Salivary incontinence along with incontinence of feces or of urine occurred in 27 patients and it was the sole form of incontinence in only 9 patients. An example of the latter group shows the defiant, outwardly directed aggressive attitude associated with salivary incontinence. The patient, a 22-year-old catatonic, was the son of a well-known naval officer. His illness had developed gradually since puberty and was manifested by impulsive conduct, sudden rages and transient paranoid episodes. His admission to the hospital followed his engagement to marry. He was restless, excitable and irritable. He complained that he had come to the hospital because of the wishes of his father and not because he himself felt in need of treatment. He assumed queer postures, thought his food was tampered with, and felt a sensation of electricity going through his body. In moments of sudden rage he destroyed hospital property. He frequently spat on the floor and on the walls of his room. When asked why he did this he replied, "I hate to swallow my spit all of my life." (Why?) "I am anxious to get out of this place. I don't like putting myself under medical orders. I don't like losing my command."

Characteristics of those with fecal incontinence and who believed that they were little children are shown by the 25-year-old catatonic son of a wealthy Jew. After many years of mental illness he believed that he was only four years of age. He spoke in a high-pitched, childish voice. "I want to be with my mama and let her nurse me and have diapers on." When his mother visited him, he delighted in sitting on her lap with his head on her breast. With other people he was extremely aggressive and often struck at physicians and nurses. In his more disturbed periods he wet and soiled himself, picked feces from his rectum and then smeared his face, his body and the walls of his room therewith. He often grabbed a handful of feces before allowing himself to be led from his room to the bathroom. On returning to his room and after being cleaned he promptly smeared himself again with feces. When his mother urged him to adopt more cleanly habits he denied any recollection of his smearing.

Among the patients who soiled themselves and believed that they were important people was a 30-year-old catatonic. At the beginning of his acute illness he was assaultive and destructive. He had a vision in which he saw the Holy Ghost. A voice told him that he was God and that he would become president of the United States. He accepted this message as fact and said, "There is nothing that we can't do. If you are clean, you have the light of God with you all the time. That is why my body is pure gold." He indulged in anal masturbation and smeared his body with feces. Using vulgar terminology he declared that he had eaten his own feces and that he knew it was pure food.

The majority of patients who were incontinent of urine also were incontinent of feces or saliva. However, there were 17 patients who showed only incontinence of urine. In the latter group there was a general tone of aggressive defiance which was expressed by loud, vulgar, sarcastic or teasing talk and by the destruction of personal property, rather than by trying to physically injure other people. These patients also showed a marked tendency to exhibitionism, physically, intellectually, or both.

This type of reaction is illustrated in the case of a 20-year-old Jewish salesman. He had learned easily at school and received good marks. He had planned to become a lawyer, but his desire

for fine clothes led him to enter business before completing his education. With the opposite sex he was shy and his acquaintance with them was gained principally from reading. In his acute illness he heard imaginary voices and assumed queer postures. He appeared depressed and thought that he would be electrocuted. Later he became excited and paced restlessly about the ward. He burned a hole in his blanket and he tore his clothes. At times he urinated on the floor. He told many jokes of an erotic nature and bragged of his sexual conquests of women. He exposed his genitals and masturbated openly. Using vulgar terminology, he delighted in showing off his anatomical knowledge. He said that he had a penis and prostate gland as big as those of a horse—"Want to know how my interstitial cells are? O. K. How my gonads are? O. K."

Among the 78 incontinent patients showing outwardly directed aggression and false ideas as to personal identity there were 66 who did not at any time during the incontinent phase of illness show an inwardly directed aggressive trend. Evidence of inwardly directed aggression was said to exist when the patient was self-depreciatory and had thoughts of self-injury or actually attempted suicide.

During the incontinent phase there were 12 patients whose trend was marked by a mixture or by a quick alternation of inward and outwardly directed aggression. The more common modes of attempted self-injury among incontinent patients were throwing themselves or beating their heads against hard objects, and swallowing foreign bodies.

In some of the schizophrenic patients there was a long period of depressive, suicidal, inwardly directed aggression, during which the patient was continent. This was followed by a period of outwardly directed aggression associated with incontinence. This sequence in behavior is illustrated by the course of the illness in a 28-year-old catatonic business man. His illness followed a minor love affair and apparently it was precipitated by the girl breaking a social engagement with him. In the first two years of his sickness there was a sad, self-depreciatory trend, with delusions of wickedness. He was often tense and agitated because the voices accused him of having ruined the girl's reputation by impregnating

her. He believed that the voices were telling the truth and begged to be turned over to the police in order to be punished for having committed rape. On two occasions he attempted suicide by hanging. Thereafter for the next year he developed false beliefs relative to his personal status, saying at different times that he was dead, a little child or a dog. He impulsively struck male nurses, threw dishes at them and broke window panes. He wet and soiled his bed and the floor of his room. During the latter period of outwardly directed aggression, he made no serious attempts at self-injury. Occasionally, while smiling, he spanked his own buttocks with a soft bedroom shoe because of his desire to masturbate.

Some of the incontinent patients expressed ideas that the excretory products were of great value and that these products possessed magical qualities. A 48-year-old catatonic business executive while in a tense, resistive state, drank his own urine and claimed that it was a fine medicine. After he had urinated in two places on the floor and while the nurse was cleaning it the patient remonstrated, "There you are again spoiling everything. Two good specimens of highly valued medicine wasted, just as I was ready to blend them into perfect union . . . Human excreta is the purest chemical substance."

Similar ideas were expressed by a 49-year-old real estate salesman. While in an excited, resistive, and destructive phase of manic-depressive psychosis, he heard voices calling him God. He defecated on a piece of paper, carefully wrapped the feces in paper, and hid it in his bureau. Later he proudly showed the feces to his physician, saying that he was keeping it for experimental purposes, for it might turn into a bullfrog or an oyster. A 19-year-old college student in a period of catatonic excitement broke the blossom from an Easter lily. On being reproved for this he replied that he could reunite the broken blossom to its stem by means of his own saliva.

Many of the patients in the incontinent group had long periods during which they were continent and manifested a passive acceptance of hospital routine, without any tendency to injure others or to destroy personal property. These quiescent periods were interrupted now and then for a few days or months by an exacerbation

of the illness in which the patients were assaultive, destructive and incontinent of feces and urine.

In the group of continent patients with outwardly directed aggression and coincidental false ideas of personal identity there were only four patients. These four patients left the hospital in an early stage of their acute illness and a report on the status of their continence thereafter was not obtainable.

SUMMARY

A study was made of the records of 366 disturbed male patients who were treated in a mental hospital during a period of approximately ten years. Those whose illness was associated with organic disease were excluded from the group studied. In the remaining group of 235 patients with psychogenic psychoses comparisons were made between the incontinent and the continent patients in regard to formal diagnoses, outcome of illness and mental trends.

CONCLUSIONS

Among the disturbed male patients who were suffering from functional psychoses a study of incontinence with respect to type of illness, outcome and mental trend, permits the following conclusions:

1. Incontinence of feces, urine or saliva was present in almost 50 per cent of these patients at some time during the illness.
2. Dementia præcox was the formal diagnosis in 72 per cent of the incontinent patients and incontinence was observed more than four times as frequently in the catatonic form than in any other.
3. There was little difference in the outcome of illness of the incontinent and continent patients at the end of a three-year period of study.
4. The most common mental trends accompanying incontinence are revealed in an outward turning of aggression and in false ideas of personal identity. The patient believed himself to be, and acted as if he were dead, dying, a child, an animal, or a very important person.
5. These false ideas as to personal identity with the corresponding behavior were the only constant symptoms of the so-called con-

fusion that is often apparent in disturbed patients, especially those with the diagnosis of catatonic dementia præcox.

6. There were occasional patients who believed that their excretory products had great value or magical properties.

7. Incontinence of saliva, urine or feces appear to have equivalent value in the expression of an aggressive attitude. They all suggest a regression to the infantile period of life, a period during which excretory products may be freely manipulated and believed to have magic properties.

8. Outwardly directed aggression and false ideas of personal identity are seldom observed in disturbed patients who are continent.

9. The manifestations of outwardly directed aggression and false ideas of personal identity may precede by several weeks the onset of incontinence.

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THE ETIOLOGY AND PREVENTION OF "LUNG ABSCESS" IN METRAZOL THERAPY

BY MARK ZEIFERT, M. D.

During the past few years there has been prodigious activity in the field of convulsive therapy of schizophrenia. The favorable results reported from the use of this modality have encouraged many workers to engage in large-scale therapeutic efforts. The few complications that have occurred have not always received the etiologic research to which they were entitled. The purpose of this paper is to submit an explanation of the nature of the "lung abscess" seen in this form of treatment.

There are few references in the literature to the pulmonary complications in this form of therapy. Von Meduna and Friedman¹ in their exhaustive analysis of treatment in 3,000 cases, speak of them as being "due to aspiration, infarction and pulmonary edema during the convulsions." They further state:

. . . if the treatments are administered to a healthy person (free from cardiac and respiratory disease of any type) and if an absorbent gag made of cellucotton or a similar substance to absorb orotracheal secretions is employed, this complication ought to be minimized. In several hospitals either a hard rubber gag is used or one made of several wooden tongue depressors wrapped in gauze; both of these are believed to be inadequate. Another precaution is to give the treatments only if the stomach is empty, preferably before breakfast, to avoid aspiration of regurgitated material. Some workers placed the blame of the pulmonary complications (and possibly the cerebral in one case) on the loosening of a thrombus from the antecubital veins, which became inflamed as a result of the treatment or possibly of local mechanical irritation because of the struggles of the patient against injections. This factor cannot be overlooked.

Since October, 1937, the writer has induced about 8,500 metrazol convulsions and about fifty camphor convulsions. Early in our experience it was observed that notwithstanding all precautionary measures an occasional pulmonary "abscess" appeared. It should be noted here that patients were prepared for treatment with metrazol according to standard practice, i. e., they were given nothing

by mouth the morning of treatment, their mouths were inspected just prior to injection for foreign bodies (chewing gum, buttons, wads of paper, dentures, etc.), every effort was made to absorb or wipe away oral secretions during and after the convulsive seizure. The metrazol used was the standard 10 per cent aqueous solution. It soon became apparent that the etiologic factor of this complication was not related to conditions existing in the oral cavity in the average case.

It was then decided to make a careful study of the entire routine of treatment, administrative, nursing and medical. We soon observed that when the patients were quiet during the administration of treatment, complications did not rise. Another feature made itself apparent early in the investigation. The only patients who developed pulmonary complications were those whose veins were entered with difficulty or who required reinjection because their struggles caused the needle either to slip out of or to perforate the posterior wall of the vein. It occasionally happens that a vein is entered and a small amount of blood rushes into the syringe just as the patient begins to struggle and although the nurses quickly restrain the patient, the needle may slip out of the vein. A neighboring vein must then be quickly entered and the contents of the syringe injected. *It was only in cases where delay occurred between the entrance of blood into the syringe and the actual injection of its contents into the vein that pulmonary complications occurred.*

With the foregoing observations in mind, we proceeded to review from the roentgenologic aspect all cases of "lung abscess" in our series. The immediate and most striking observation was that practically all of the plates could be divided into either right-sided or left-sided *wedge-shaped, hilar* areas of radioopacity. A large proportion of these plates appeared to present areas of infarction which were almost identical with each other, and one gained the impression that the plates could actually be superimposed on each other because of the almost geometric similarity of the areas of involvement. The accompanying plates (Figures 1 to 5) clearly demonstrate the nature of the lesion and its progress. In studying the plates, one notes that the condition first begins as the pneumonitis of infarction and later goes on to cavitation.

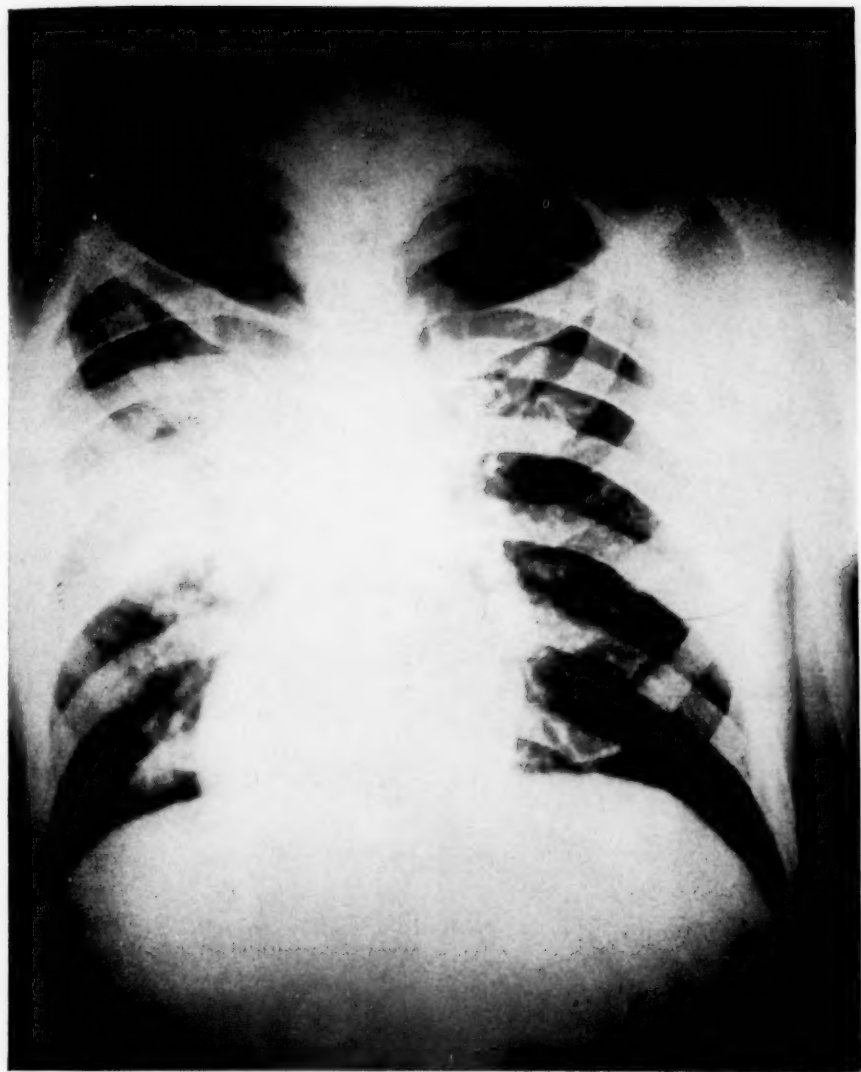
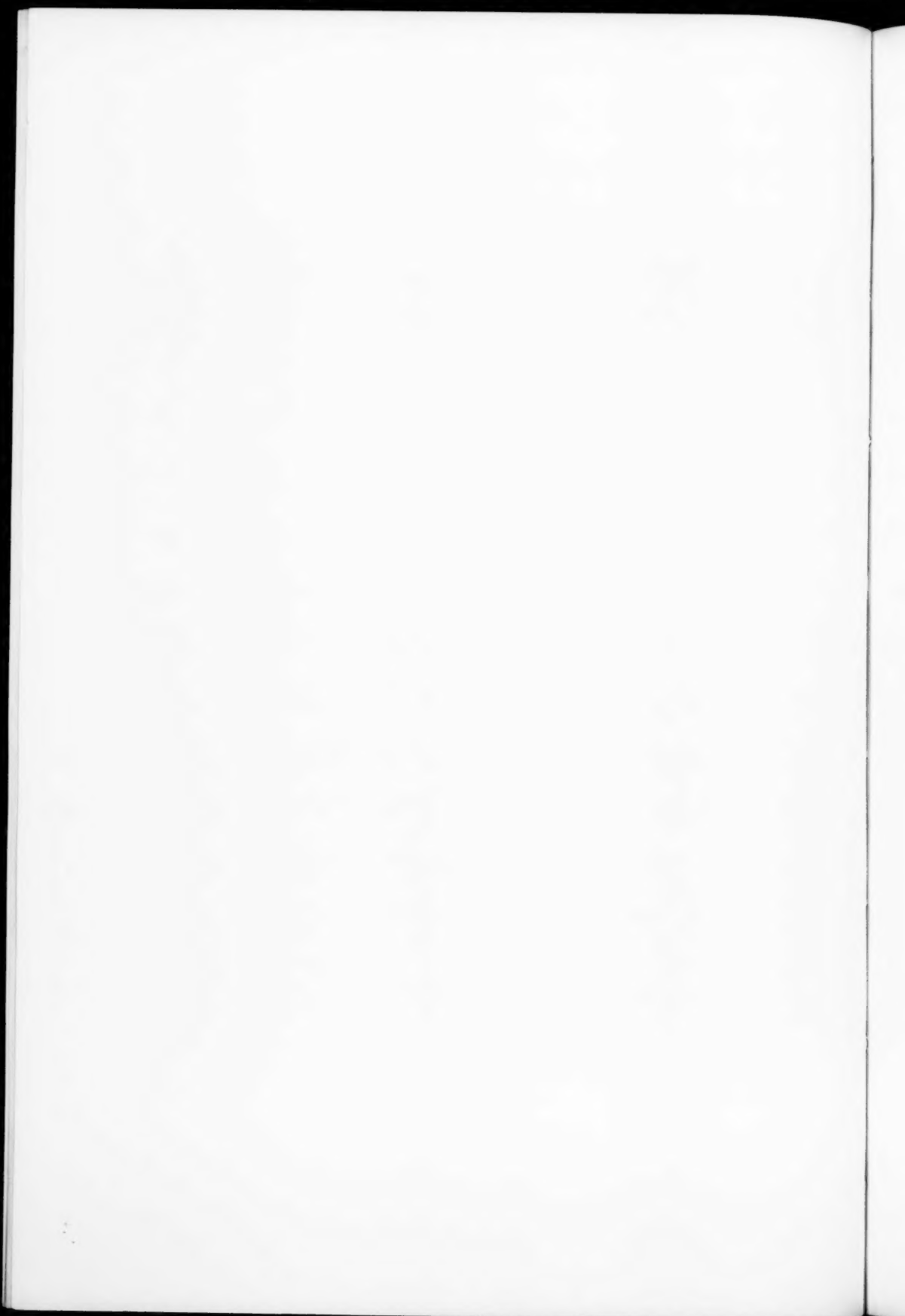


Fig. 1. Case M. O.—Chest plate 72 hours after last metrazol injection, showing central involvement



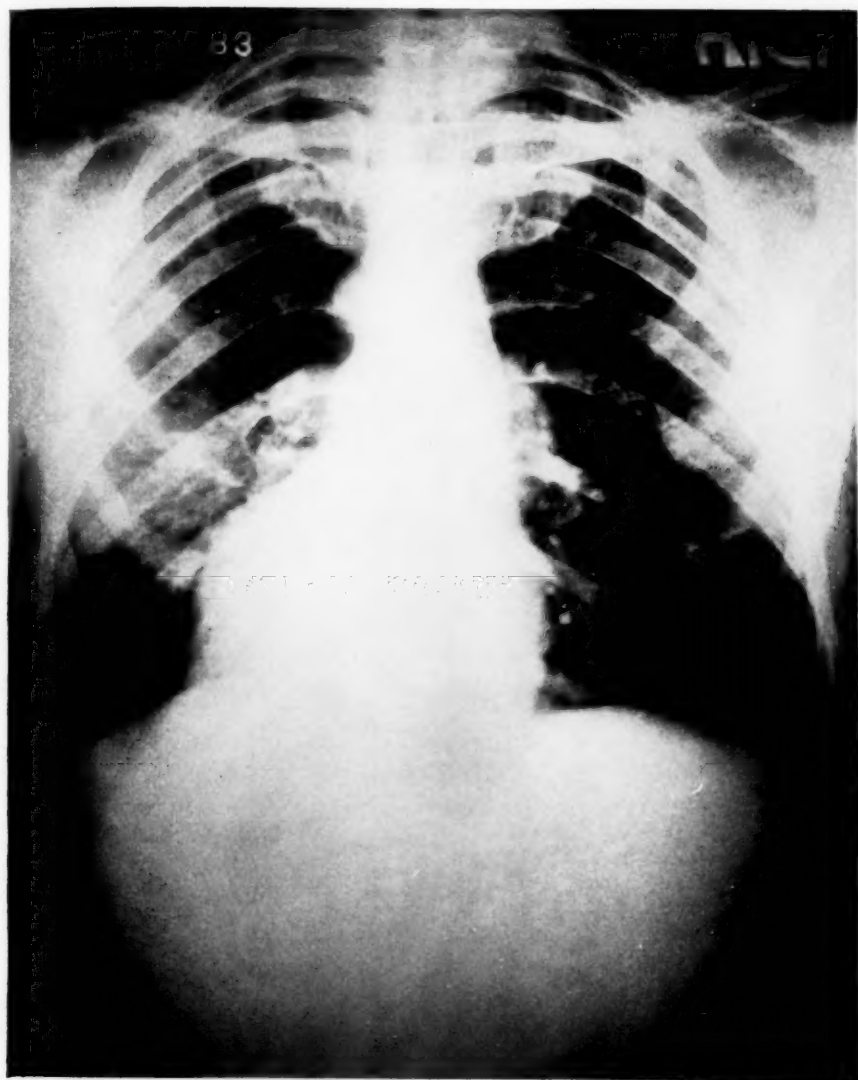
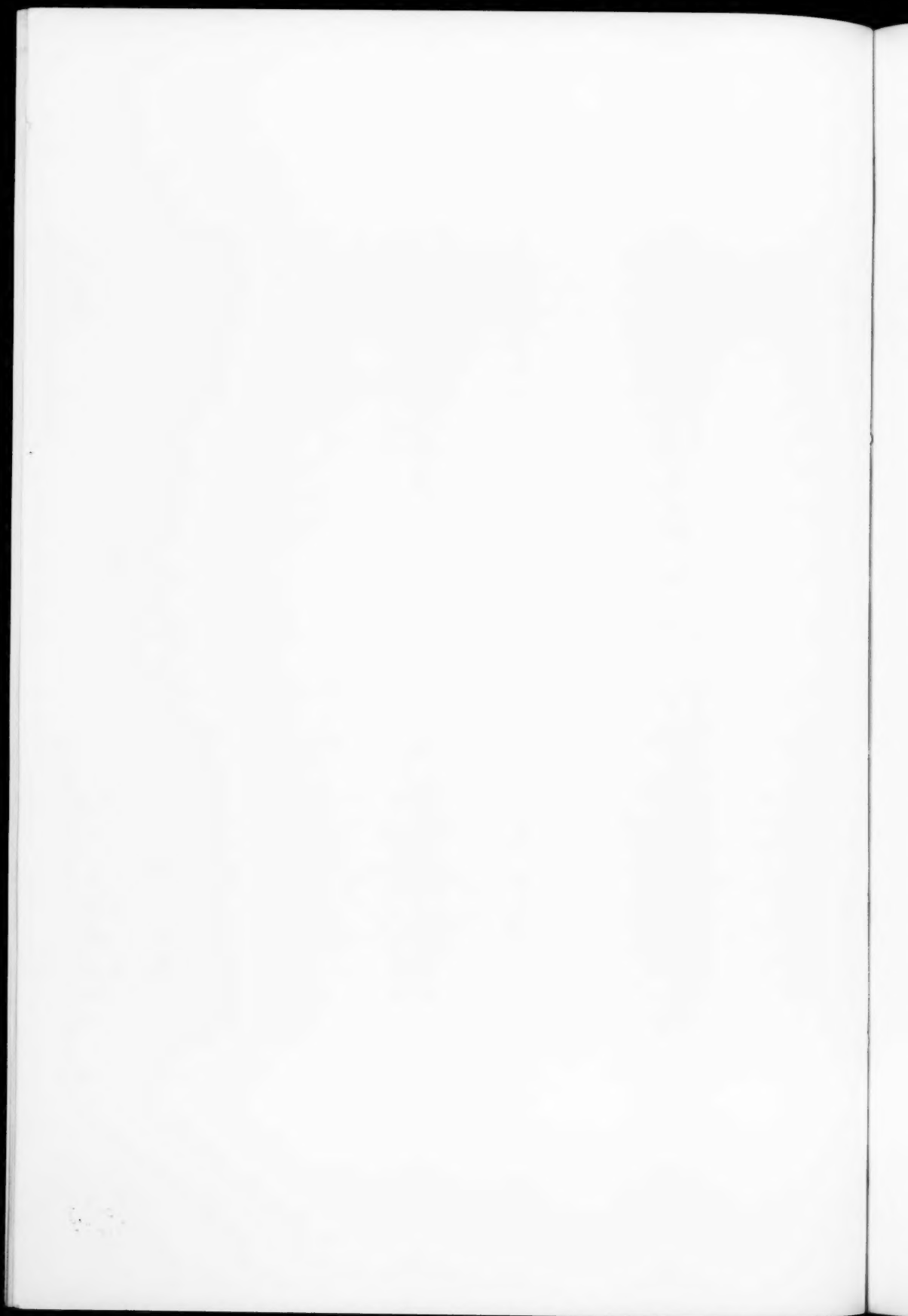


Fig. 2. Case O. M.—Chest plate 48 hours after last metrazol injection, showing central involvement



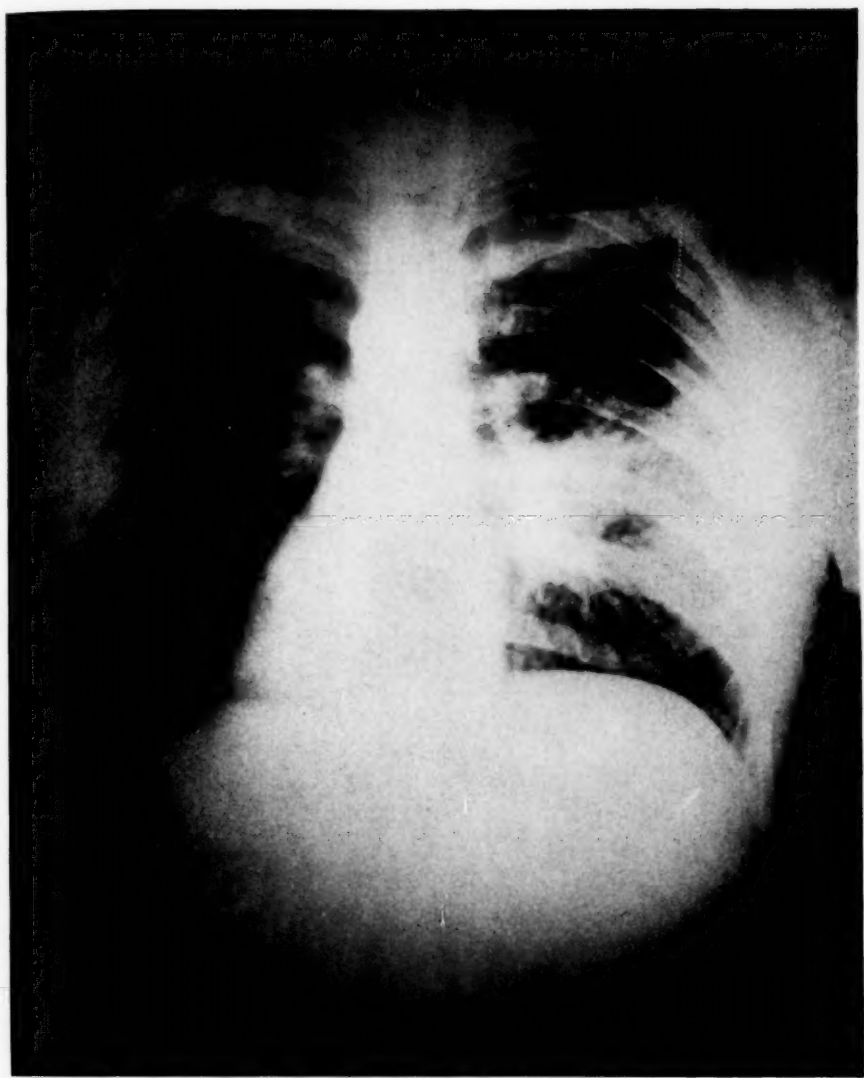
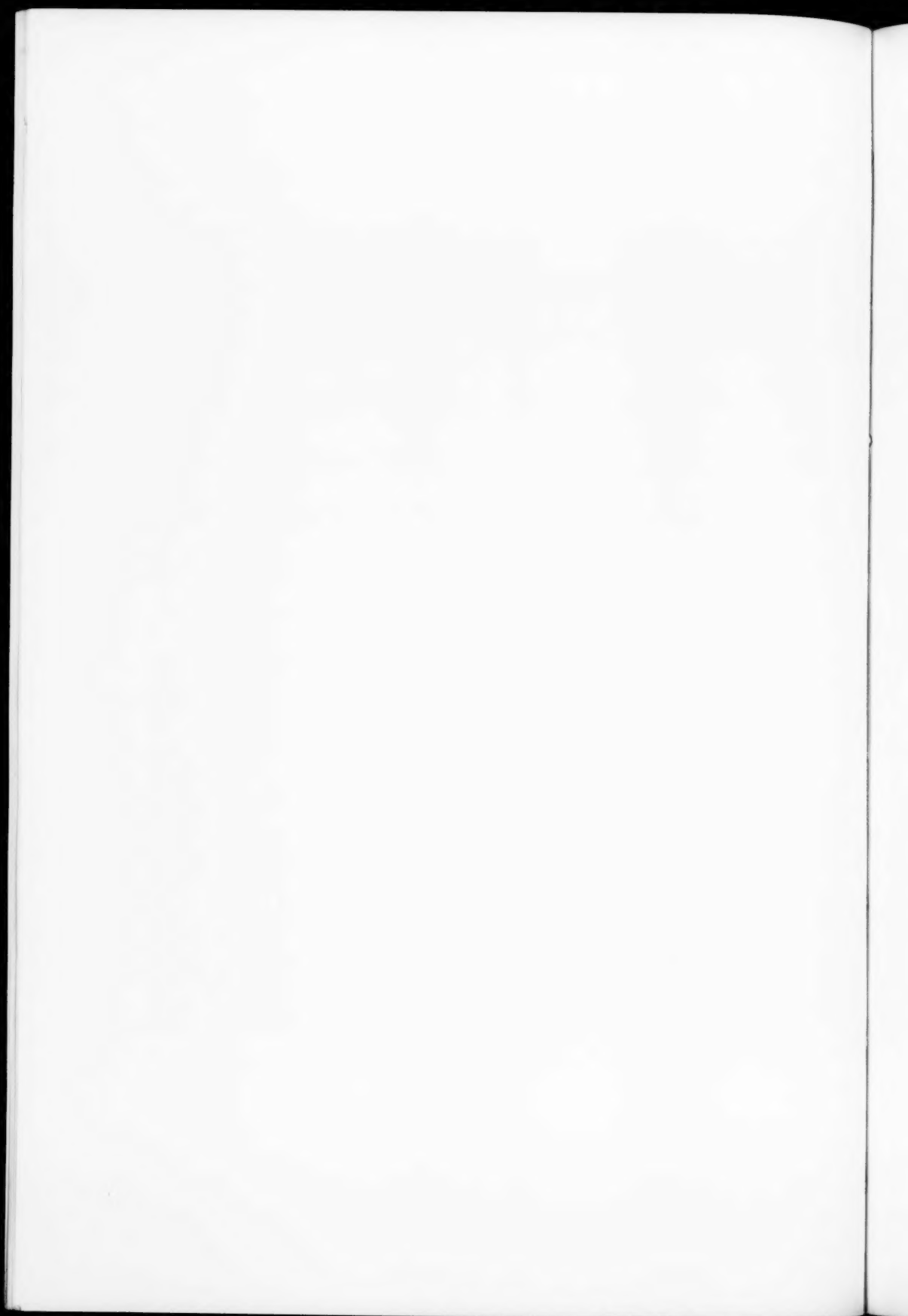


Fig. 3. Case S. S.—Chest plate showing typical central involvement and pneumonitis surrounding lung abscess



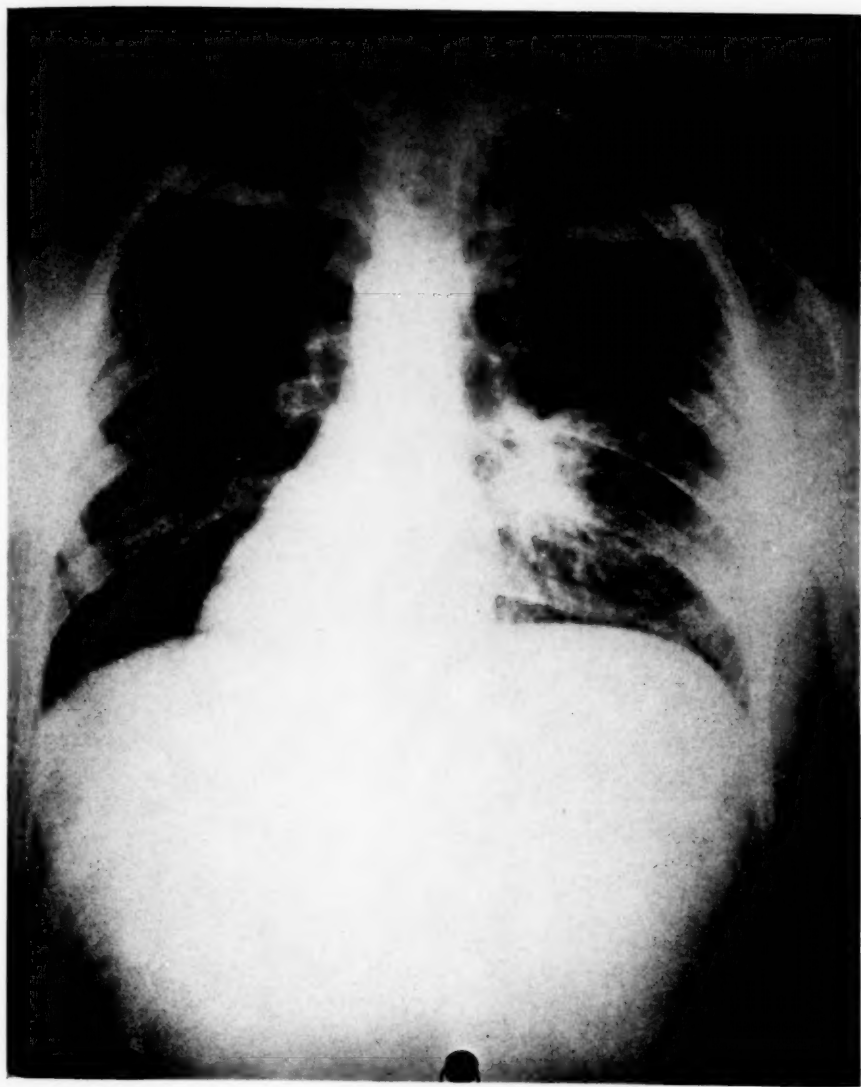


Fig. 4. Case S. S.—Chest plate 7 days after Fig. 3, showing the rapidity of the healing process





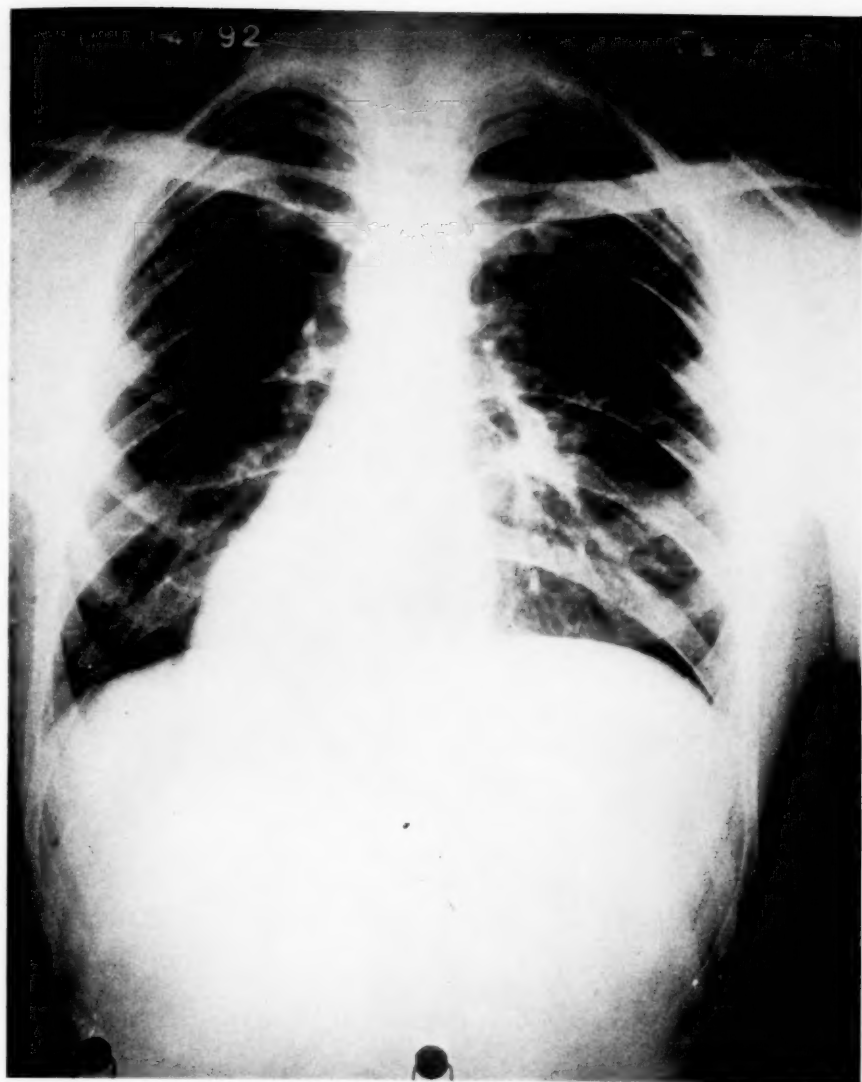


Fig. 5. Case S. S.—Chest plate 36 days after Fig. 4, showing healing almost complete



A review of the clinical findings also revealed a striking similarity in all cases. Whereas the mode of onset in lung abscess is comparatively insidious, in these cases it was dramatically acute. Here it was usually within 24 hours after the last treatment. The symptoms were characterized by sudden, severe pain in the chest accompanied by cyanosis, dyspnoea, cough, temperature of 104° to 106° F. and marked prostration. Fetor oris and foul-smelling sputum occurred only late in the disease, if at all. During the first few days of the illness, percussion and auscultation were fruitless, but later on there were physical signs of consolidation, followed in some cases by cavitation. It should be noted here that the subjective signs were consistently identical in all cases while the physical findings varied. The patients were ill from 10 days to eight weeks. They all received conservative treatment.

On the basis of the X-ray findings and the great similarity of clinical pictures, it was decided that the etiologic factor in all our cases was pulmonary embolism on which a process of suppuration was subsequently superimposed. The investigation then converged upon the problem of determining where the emboli originated and how they were introduced into the blood stream.

During the ordinary intravenous injection of metrazol solution, the fluid is injected at great speed as soon as it is apparent that the needle is precisely within the lumen of the vein. The small amount of blood that enters the syringe is promptly pushed back into the vein before enough time has elapsed for it to coagulate. It is a matter of common observation that the blood of some patients coagulates more rapidly in metrazol solution than that of others. We have seen small blood clots appear in the syringe within 15 seconds after the needle entered the vein. It is obvious that re-injection of such bits of clotted blood will result in embolism. That these emboli are not the products of old thrombotic processes resulting from previous injury to the vein, as has been claimed by some workers,¹ can be demonstrated by using a vein that has not been previously entered and observing with the aid of a stop-watch how rapidly clots appear in the syringe.

Having made this discovery, it became imperative that a method be devised for the prevention of this complication. At first, we discarded every dose in which there was even the smallest delay be-

tween the appearance of blood and the completion of injection. We soon found, however, that aside from the obvious waste of the drug, the method was uncertain as some bloods clotted in the solution while the piston of the syringe was actually in forward motion. This was especially true in the cases where large doses had to be administered through a small calibre needle because of the narrow lumen of the vein—involving an injection time of perhaps 30 seconds. To obviate this uncertainty, it was decided to add an anticoagulant to the metrazol solution.

Due to the fact that metrazol has no chemical incompatibles among the common therapeutic agents,² we considered the addition of the usual anticoagulants to a standard metrazol solution. However, the question arose as to the possibility of chemical interaction between metrazol and the anticoagulant during exposure to the high temperatures and pressures required for sterilization. In the selection of a good anticoagulant, a number of requirements must be met, that is, the substance should be comparatively simple in chemical structure, easily obtainable, and inexpensive. In addition it should neither itself be altered by reaction with the convulsive agent at high temperatures and pressures, nor should it alter the convulsive properties of the therapeutic agent.

Although a good many of the known anticoagulants met these requirements, we finally decided on the one used routinely to prevent clotting in the collection of blood for chemical analysis. We therefore prepared a 10 per cent solution of metrazol in a vehicle consisting of 2.5 per cent chemically pure sodium citrate in distilled water. This solution was then autoclaved and thereafter examined for alteration of character. Inasmuch as no change was apparent, it was administered to a group of patients in the regular therapeutic dose. It was found that the usual dose produced the typical grand mal type of metrazol seizure. Apparently, there was no change in the convulsive property of the metrazol, nor for that matter was any other pharmacologic change noted, as a result of the mixture of the two drugs. These findings have been confirmed by Bilhuber.³

We have devised the following method of preparation of large quantities of the convulsive agent: Fifty gm. of metrazol powder and 12.5 gm. of sodium citrate (C. P.) are dissolved in sufficient distilled water to make a final quantity of 500 c.c. The solution is

then filtered and divided into 10 units of 50 c.c. each. These quantities are poured into 60 c.c. heat-resisting screw-cap bottles containing a soft rubber gasket within the screw-cap. The bottles are then autoclaved for 30 minutes at a pressure of 15 pounds and a temperature of 121.5° C. A new solution is prepared every other day, although we have frequently resterilized old solutions without reducing their efficacy.

This anticoagulating metrazol solution has been in use for the past eight months during which time no pulmonary complications have developed in any of our cases. Our experience with metrazol therapy dates back 16 months. In the first eight months, when we used the ordinary aqueous solution, we had seven cases of pulmonary embolism followed by lung abscess. Since the introduction of the anticoagulant into the convulsive solution we have induced 3,200 convulsions without a single case of pulmonary embolism or any other lung complication.

DISCUSSION

It is apparent from the preceding observations that what was formerly considered "pulmonary abscess" as a complication of metrazol therapy in the psychoses is in reality, pulmonary embolism with a secondary suppurative process superimposed. The embolism is due, the writer believes, to the injection of tiny clots which are formed in the metrazol solution between the time the needle enters the vein and the time the last drop of metrazol leaves the syringe on its way into the vein. It would seem that the amount of orotracheal secretion during the metrazol convulsion is negligible and that the type of mouth-gag used does not exert any influence on the prevention of pulmonary complications. In 8,500 induced metrazol convulsions, we have not seen a patient vomit during the seizure nor in the 20- or 30-minute period following. Further, by the time vomiting does occur, which has been rare in any case in our experience, the patient is sufficiently conscious to have regained his cough reflex and thus avoid aspiration. The theory of aspiration of vomited gastric contents, in our cases at least, is doubly disproved by reason of the fact that our patients receive a very light meal at 5 p. m. the day before treatment and are thereafter permitted to take only water until 9 p. m. Therefore, when the treat-

ment is actually given, the patients have had nothing by mouth for the 12 hours immediately before its administration and have actually had no solid food for 16 hours before the convulsion.

CONCLUSIONS

1. "Lung abscesses" previously described in the literature as a complication of metrazol therapy are in a majority of cases due to pulmonary embolism.

2. The emboli are formed in the syringe as a result of the coagulation of the small amount of blood that enters it immediately after the needle pierces the vein and during the time it takes for the piston to reach the base of the syringe.

3. A solution of metrazol containing an anticoagulant has been devised and its method of preparation and sterilization described.

4. Metrazol solution prepared with sodium citrate according to the method described in this paper produces the same therapeutic result as does metrazol prepared in an aqueous vehicle.

5. The administration of metrazol solution containing sodium citrate as an anticoagulant prevents the formation of blood clots in the syringe and needle while the drug is being given.

6. We believe that with the use of citrated metrazol solution pulmonary complications can be reduced to a minimum.

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THE PSYCHOTHERAPY OF HOSPITALIZATION

BY SAMUEL R. LEHRMAN, M. D.

Introduction

The advent of newer and more "specific" methods for the treatment of mental illness, and the study of the mechanisms of these forms of therapy, has necessitated a revision of standards. While some criteria for diagnosis have already been changed and more intense studies in prognosis instituted, little work has been done on the "spontaneous" remission and the psychotherapy of hospitalization.

In the past the term spontaneous remission has been much misused. Too often this term has been employed to designate a remission following some varying period of hospitalization. It is conceding a great deal to pessimism to allow this synonymy to go unchallenged, for the spontaneity of a remission during hospitalization cannot be estimated without statistical studies of remissions in nonhospitalized patients. In addition, the value of hospitalization can be demonstrated clinically in patients who improve after being hospitalized and decline when released too soon (see Cases 1 and 2). We must therefore delimit the term spontaneous remission to a remission or recovery occurring at the scene of the onset of the psychosis.

Although Horwitz and Kleiman¹ have shown that there is no correlation between length of hospital residence and extent of improvement in dementia praecox, this in no way denies the value of hospitalization as a psychotherapeutic agent. Even with such specific therapies as the antisera, there are pneumonia patients who under exactly the same conditions, will require one-half the dose that others require. Statistics show that if the minimum "dose of hospitalization" is large enough, there is high positive correlation between hospital residence and recovery. Taylor and Von Salzen² record that 452 out of 487 paroled schizophrenics (these patients were treated by hospital routine alone) had a hospital residence of 26 months or less; and 235 were in the hospital less than 12 months.

The psychotherapy of hospitalization is included among the few time-tested therapies in use today:^{3,4} Specific drug therapy for such diseases as syphilis, pellagra and similar organic conditions; other drug therapy, the actual pharmacological action of which may be open to question, such as insulin, metrazol, and so forth; physical therapy (including radiothermy and thermal therapy by malaria and biologicals); general medical and surgical care; occupational therapy; direct psychotherapy in the form of persuasion, suggestion, confession-catharsis, and close personal contact with the physician, attendants or nurses; and "custodial care,"* including industrial employment within the hospital. Since all these factors can work in harmony only in a psychiatric hospital, it is obvious that the mere accomplishment of hospitalization has contributed to the treatment of the patient over and above the individual treatments used.⁵ This gestalt conception of hospitalization is not only an attestation of its therapeutic value but is an addition to the indirect but active psychotherapy resulting from institutionalizing the patient. It represents in fact the finest paradigm of practical psychobiology.

Black⁶ and Beckenstein⁷ individually studied the reactions to hospital care and treatment of 100 patients who were paroled after varying periods of hospitalization. Eighty of Black's patients said that they found hospitalization beneficial to them. Although Black has also pointed out the danger of relying on patients' subjective statements and although he makes little attempt to analyze the specific factors having a therapeutic effect, at least one objective conclusion can be drawn from his work: namely, that hospitalization *per se* was considered a therapeutic agent. Beckenstein's method differed from Black's in emphasizing various features of hospitalization rather than hospitalization as a whole, but a similar conclusion can be drawn from his study.

The following cases were studied on a male service at the Utica State Hospital. They are presented as examples of improvement which seemed to bear no relation to direct psychotherapy on the part of physicians, nurses or attendants. Nor was formal occupa-

*"Custodial" is defined in Webster's Dictionary as "relating to judicial or penal safe keeping." By definition, therefore, the term "custodial care" is obsolete. When this concept is employed to mean attention merely to the vegetative needs of the individual (eating, sleeping, elimination and protection from the elements) there is still an inherent protective mechanism reserved for the patient alone.

tional therapy employed. Indeed the improvement appeared to result only from hospitalization.

CASE REPORTS

Case 1. Single. Male. Age 30. Diagnosis: Dementia præcox, hebephrenic type.

There were three suicides in this patient's paternal line. He is of normal intelligence and his development was said to be normal. His psychosis began at 14, following an injury. He followed his mother around the house, was fearful of poison and had other delusions and hallucinations. He was first admitted July 11, 1925 (age 16½), following a period of excitement in reaction to delusions and hallucinations. He improved rapidly and was allowed to return home. He was readmitted during November, 1926, but did not improve until April, 1932. Following a satisfactory visit to his home, he was paroled on April 29, 1932. Eight months later he returned with his old complaints but soon began to improve. In December, 1934, he again went home for a two weeks visit from which he returned, dazed and out of contact. Subsequent improvement was slow but another visit was allowed in December, 1936. The previous cycle was repeated. He returned in January, 1937, but six months' later had parole privileges. Another visit on December 18, 1937, terminated in his return on December 31 with the same loss of contact. On September 5, 1938, he again resided on a parole ward and was allowed another visit on December 17, 1938, from which he returned in five days, autistic and mute. No improvement was noticed until February, 1939.

Case 2. Single. Male. Age 23. Diagnosis: Dementia præcox, hebephrenic type.

This patient, of excellent intelligence, a child of elderly parents, is described as having had a normal birth and early development. His psychosis began one month prior to his admission on September 12, 1938. It was characterized by depression with strong conscious death wishes, conscious guilt feelings over masturbation, and the delusion that his nose was the most hideous thing in the world, causing everyone to talk about it. He was transferred to a depressed ward on September 26, 1938, but improved in two days,

spontaneously approaching the writer, saying "I'm not that bad, I'd like to go to another ward." He was paroled October 13, 1938. (He returned 10 days later, however, received a course of insulin therapy, from October 26 to December 8, and was again paroled December 20, 1938. To date he has made a satisfactory adjustment at home.)

Case 3. Single. Male. Age 40. Diagnosis: Dementia præcox, hebephrenic type.

This patient has two psychotic siblings, one mentally defective sister, and one "nervous" sister. His birth and early development were normal but he always depended on his mother and older sister. He is of borderline intelligence and was dismissed from the U. S. Navy for incompetence. He has had two previous admissions with hospitalizations of less than seven months each. Hallucinations and delusions of persecution were present and the diagnosis in each case was dementia præcox, hebephrenic type. He was again admitted July 2, 1938, 11 years after his last discharge, complaining of persecutory auditory hallucinations. He improved immediately on admission and continued to improve after transfer to the continued treatment service. In 10 days he was on a parole ward and was paroled to the custody of his older sister, October 25, 1938. (On January 12, 1939, the social worker reported that he was free from hallucinations.)

Case 4. Single. Male. Age 22. Diagnosis: Epileptic, clouded state.

This patient began to have convulsions at the age of 19 but his present admission was occasioned by his reaction to being sent away from his home. He asked each member of the family for luxuries, the refusal of which resulted in his becoming overactive and extremely violent. He was taken to the county hospital and 10 days later (December 24, 1938) was admitted to the State hospital. He was placed immediately on a disturbed ward in the main building.* The next day he quieted down and continued quiet and agreeable since then, despite occasional convulsions.

Case 5. Single. Male. Age 22. Diagnosis: Dementia præcox, hebephrenic type.

This patient's mother died when he was three years of age. He

*The "main building" at the Utica State Hospital houses the bulk of the continued treatment services.

was reared by a paternal grandmother. His early development was considered normal; his intelligence, described as borderline. The psychosis began two months before admission and was characterized by a sensation as though his heart "had stopped beating." He also had ideas of reference, ideas of persecution, and visual and auditory hallucinations. At the reception building where he was admitted March 23, 1938, he was described as preoccupied, forgetful, silly and superficial. He was transferred to the main building, April 8, 1938, where he was agreeable and cooperative. In a month he had parole of grounds, and was later paroled home, August 1, 1938. (He returned, hallucinated, September 26 but improved rapidly and was again on a parole ward, December 31, 1938. Insulin therapy was deemed advisable and instituted shortly thereafter.)

Case 6. Single. Male. Age 34. Diagnosis: Dementia præcox, catatonic type.

This patient, of average intelligence, had a negative family history and a normal birth and early history. He enjoyed dances and parties but took no particular interest in the opposite sex. His psychosis seems to have been precipitated by his father's accidental death at 82. The patient became mute, resistive, hallucinated and delusional and was admitted directly to a disturbed ward in the main building, April 13, 1938. On April 25 he was described as cooperative and was transferred to a more comfortable ward. He was given parole privileges June 13 and was paroled August 16, 1938. (A report from parole January 29, 1939, indicates a satisfactory adjustment.)

Case 7. Married. Male. Age 42. Diagnosis: Manic-depressive psychosis, manic type.

This patient, of average intelligence, had a psychotic brother and a psychotic uncle. There have been several admissions since his first attack of depression at the age of 22. The diagnosis each time was manic-depressive psychosis, depressed type. At his present admission February 21, 1936, his behavior was characterized by overactivity, overtalkativeness, singing and whistling. He was transferred to the main building, April 6, 1936, and placed on a disturbed ward. Almost immediately he quieted down and was resid-

ing on a parole ward within three weeks. He was paroled July 26, 1936, and returned July 11, 1937. Since then he has been paroled and returned twice. At his latest admission, December 4, 1938, he was in a highly elated state. Although he was placed on a fairly comfortable ward, his overactivity was such that a semidisturbed ward was deemed advisable. On hearing of this suggestion, he promised to become quieter but failed to do so when the order of transfer was remanded. He was accordingly transferred but within a day had visibly improved and requested that he be taken from the disturbed ward. He said "I'm not as bad as those fellows; no, I'm not that bad." He was removed to a comfortable ward, shortly reached a parole ward, and was paroled February 9, 1939.

Case 8. Married. Male. Age 29. Diagnosis: Manic-depressive psychosis, mixed type.

This patient, of average intelligence, was said to have had a normal birth and early development, although his mother is described as unstable. He has been "nervous" since the age of 11, when he was frightened by the commotion over the death of an infant brother. At 12 or 13 years, he practiced mutual fellatio with a friend and this has remained vivid in his mind. He was first admitted April 24, 1934, because of an acute depression with strong feelings of guilt and persecutory hallucinations. The precipitating cause was said to have been a friend's wedding. He improved rapidly and was paroled October 6, 1935. Diagnosis: Dementia praecox, hebephrenic type. He was married 14 months later, shortly after discharge, to a woman who "did all the courting." She subsequently neglected him and broke up the home. He was readmitted September 4, 1937, depressed, agitated and expressing a desire to die. Transfer to a depressed ward in the main building had no effect. He underwent insulin therapy from January 14, 1938 to April 11, 1938, with no improvement. Persecutory hallucinations were admitted. During August intense psychotherapy was tried in the form of confession with attempts at suggestion and persuasion. This too seemed to have no effect and he was allowed to be alone as he desired. On October 26 he was still seclusive, delusional and hallucinated but a month later began to improve. He was given work on the road party and was transferred to a parole ward De-

cember 31, 1938. At the present writing he is free from hallucinations and from his more severe delusions. His return home has been approved.

Case 9. Married. Male. Age 40. Diagnosis: Dementia praecox, hebephrenic type.

This patient's family history is negative except for a paternal aunt who was "mentally ill." He was the oldest of six sons and his birth and early development were said to have been normal. He contracted a congenial marriage at 25 to a woman three years his senior. His subsequent social contacts have been predominantly with men. The onset of his difficulties occurred two years prior to admission, when his brother failed in a political election. Following this he became paranoid, grandiose, hallucinated along religious lines and overproductive and irrelevant in speech. He was admitted March 12, 1937. For a time there was no improvement but on June 18, 1937 he was transferred to a parole ward and was paroled July 14, 1937. Eleven months later he was returned from parole, irritable, threatening and paranoid. He was given work in the laundry and in four months had ground parole privileges. He was again paroled November 13, 1938. (A social worker's report of January 19, 1939 states that he recently lost some livestock from the farm but according to his wife, he was not as badly upset as was expected. She feels that he is making a good adjustment.)

DISCUSSION

In attempting to understand the remissions in these cases, the entire problem of mental hygiene is confronted. The problem lies not only in changing the environment and thus mitigating conflict, but in substituting sublimation as the individual's method of resolving conflicts. Psychotherapy turns the patient toward sublimation as a method of solution in place of the pathological escapes (mental disease, suicide, alcohol or drugs). The most practical working concept of a psychosis regards the illness as an attempt to reinstate certain childhood patterns of instinctual gratification. This process has been called regression and conflicts with the mature patterns. The forces of sublimation are therefore best aided by any process which tends to preserve normal adult ego values.

Keeping these facts in mind, it is evident that the initial attempt at psychotherapy is made by the immediate confinement. Even if the patient should later learn that the conflict in his mind has not been left outside the door of the reception building, for a moment there is an actual physical removal of his body and this conscious physical flight rivals the unconscious mental flight from reality and may even replace it (Cases 3 and 4). The locked door represents a deprivation of adult ego privileges and this deprivation may stimulate a return to an adult level. The loss is further emphasized on visiting days and may explain in part an improvement following a visit.⁸

Burlingame,⁹ at the Hartford Retreat, is perhaps further applying this principle. His patients are completely stripped on admission, even to ring ornaments. Immediately a revolution takes place. The patient's unconscious attempt to preserve adult values may act almost as a reflex.

At the Utica State Hospital, the reception building, Dunham Hall, is considered by the laity to be unrelated to the State hospital. This belief seems to operate in diametrically opposed ways. Some patients continue excited at Dunham Hall but quiet down immediately on transfer to the main building (Cases 5 and 6), while others quiet down apparently for fear of being transferred (Case 7). Other patients remain unaffected by impending or actual transfer (Cases 1 and 3), and one group may even become worse. In the latter groups, it can be assumed that the initial attempt at psychotherapy has failed, but with the others its effect is unmistakable. The remnants of healthy ego values have been stimulated to combat the pathological process of mental disease.

Further stimulation may occur when the patient finds himself alone. Since the psychosis represents a partial regression to the infantile state, a childish reaction to a frustration, the psychotic reacts as a child to the lonesomeness and thus tends to return to an adult level. Isolation may operate also to further remove the conflict by what Janet¹⁰ calls "the methods of mental economy, methods which aim at reducing the work of the mind and at promoting the storage of its energies." Janet also includes here "treatment by rest," and "treatment by the dissociation of fixed ideas" (Cases 4, 5, 7, 8 and 9).

In no case is a regression completely delimited. Freud¹¹ has pointed out that adult psychosexual development not only proceeds beyond certain infantile levels but always contains residua of these levels. Similarly a regression contains residua of various advanced stages in development. Many regressed psychotics have strong unconscious homosexual fixations. Without the appearance of actual homosexual perversions, a heterosexual situation encountered by such individuals may be sufficient to initiate a psychosis. For these patients the hospital environment *per se* with the social necessity for homosexual segregation has a definite therapeutic value.

Another psychotherapeutic factor which may be a corollary to the change of environment above mentioned, is a change of ward. Quite commonly⁸ it has been observed that a patient will improve when he has been transferred, usually because of administrative expediency, from one ward to another. The patients who were removed because of improvement, and those who improved upon being transferred to a less "comfortable" ward (e. g., Case 7) are not included here. (In the latter a fear of physical discomfort, coupled with a reaction to a blow to self-esteem engendered the improvement). In some cases patients were moved because of illness. It might be argued that the illness or fear of illness had a favorable effect.¹² Another factor which may have contributed is the comfort experienced upon being removed from a place which they had learned to hate, perhaps a reminder of early hallucinations or depressions. In either event, the therapeutic aim is again directed toward maintaining adult ego values.

Routine is a powerful agent of psychotherapeusis, and possibly its most important component is the idea of order. A mentally-ill patient is a chaotic patient. In hospital routine there is an inexorability of order which cannot fail to have its effect. With the active establishment of order out of chaos, that is, with the hospital acting as an additional superego, there is an inevitable turning towards recovery. Other effects contribute. The patient becomes busy with his routine and is thus allowed to sublimate the feared instincts. Responsibility bolsters his self-esteem. The advantages of belonging, the fulfillment of instinctive gregariousness, the identification with the well-ordered hospital, rival his re-

treat into himself. The increase of self-esteem which results from seeing other patients who appear to be much worse, again stimulates a restoration of adult values (Cases 2 and 7).

There are several factors operating in conjunction with the factor of self-esteem. Opposed to the element of fear of discomfort, is an actual need for punishment. There can be no question but that the need for punishment plays a role in psychotherapy. Since the very word "punishment" is frowned upon in State hospitals (and rightly so) it should be emphasized that the punishment referred to never takes the form of bodily harm. Just as a child is punished by the removal of some privilege, so is the patient punished. The patient with strong guilt feelings is often considerably aided by the knowledge that he has paid, or is paying, for his real or imagined crime¹³ (Case 6). As has been mentioned, the hospital furnishes an additional superego. The hospital environment further recreates the infantile state by assuring security, vegetative care and freedom from responsibility. The hospital is therefore a surrogate for the parents. It augments the repressive forces of the ego, it unburdens him of responsibility by suspending the demands of his psychotic environment and it absolves him from much guilt (e. g., the parents are responsible for the acts of the child). But additional guilt always arises in the psychotic conflict, and punishment may absolve this guilt and hence considerably lessen the conflict.

All the above elements play a part in what may be called the mechanism of comparison. When hospitalization exerts a therapeutic effect, it seems as though there is a "foreconscious"¹¹ knowledge that the disease into which the patient sought refuge is worse than the conflict with reality from which he has attempted to escape. The mind is not static. There is a constant interplay of impulses from the conscious to the unconscious and from both to and from the foreconscious. Henderson and Gillespie¹⁴ have aptly stated: "A mental disorder is the sum of many conditions and the end result of a long chain of processes; the cause is a process—something that moves and shapes itself in the passage of time." It might be added that this "process" continues to act even after it has evolved into a mental disorder^{15, 16, 17} and unless a similar but antagonistic chain of processes comes into play, there is no cure

for the disorder. The environment of a hospital with its multiform stimuli provides such an antagonist. In a certain proportion of cases, the stimuli of hospitalization break down the protective psychotic shell of the patient with the result that the patient's one consuming desire is to get home, not in order to confirm his hallucinations or delusions, but because he has realized unconsciously that there is no "gain in illness;"¹⁸ the refuge he sought in disease is worse than his home conflicts. A *conscious* realization is what psychiatrists call insight and is a measure of the extent of recovery.

Many of these mechanisms act synchronously, others may proceed as separate units, but always there is a struggle between the patient's psychosis and the environment into which the psychosis has placed him. Therapy succeeds only when the latter triumphs. Occasionally this struggle serves to make the patient retreat further into his psychosis. These cases are designated honestly as therapeutic failures but such failures do not warrant a discontinuance of therapy, just as a failure of the antiluetic remedies to cure some cases of syphilis would not warrant a discontinuance of these drugs.

COMMENT

An attempt has been made to outline the psychotherapy of hospitalization. If in doing this, the physician's role has become conspicuous only through its absence, it must be mentioned that this paper was undertaken mainly to show how the physician's guiding hand could improve the psychotherapeutic value of hospitalization.¹⁹ At Utica State Hospital, the physicians are making conscious attempts to utilize the above principles. Wards and occupations are changed with these ideas in mind and individual patients are deliberately thrown with others where such contacts are deemed beneficial to both or either.

Nor is it recommended that all effort be concentrated on this phase of psychotherapy. Let it not be forgotten that this is merely a *phase*; that although it should not be neglected to the detriment of other phases, neither should it be overemphasized to the neglect of the rest of the therapeutic armamentarium.

Perhaps too, some methods of observation can be corrected. If a patient improves after a period of hospitalization, it is more cor-

rect to assume that this improvement is the result of a single factor, or a combination of factors, than to assume that the improvement is spontaneous. One should be well aware, however, of the facility of error in applying causally related significance to coincidental events. In spite of this danger, it has seemed well to call attention to the general active psychotherapeutic value of hospitalization.

SUMMARY

1. The accuracy of the use of the term "spontaneous remission" has been challenged and the term defined.
2. The armamentarium of psychiatric treatment has been reviewed and the thesis of the active therapeutic effect of hospitalization has been presented.
3. Case histories have been abstracted as examples of the psychotherapy of hospitalization.
4. The elements of this psychotherapeutic effect of hospitalization have been analyzed and are presented as effects arising from:
 - a. Physical removal from an environment reminiscent of conflicts
 - b. Rest
 - c. Isolation
 - d. Routine with ergotherapy
 - e. Increase of self-esteem
 - f. Contrition and penance
 - g. Comparisons of the social forms of escape as opposed to the psychotic form
 - h. The above combining to produce a restoration of adult ego values, and hence a return from the psychosis.

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PSYCHIATRIC EVALUATION OF AFFERENT STIMULI AND LEARNING PROCESSES

BY WALLACE MARSHALL, M. D.*

The present communication will serve to classify and discuss the various components of physiological activity which form at least a major part of the basis for normal and abnormal human behavior. The paper will be presented in biological terms and will attempt to describe, in part, the physiological mechanisms of nerve impulses and also the nature of the cortical changes which may result from such stimulations. Discussion of some psychiatric implications of such reactions will follow.

I will not touch upon the physiology of the components of the nerve impulses after they leave the cortical cells, because this opens a large chapter of behavior which embodies the functions of the motor cells and nerves, the implication of the thalamus, and among other important structures and their physiology, the consideration of the autonomic nervous system.

The tracts of the cranial nerves, which subserve the power of perception, can be discussed from a peripheral and a central aspect. Thus, the former has to do with nerve fibres from the periphery of the nerve to the nerve cell. The central aspect regards that portion of the nerve cell. I shall discuss the pathology shortly which may involve these sites.

Of all the cranial nerves which have to do with perception, perhaps the optic and the auditory nerves are the most important in keeping us informed as to environmental changes which may take place. Not alone does this seem to be the case, but most educational methods and plans are so fashioned as to sensitize us to that which we read and to that which we hear. Other perceptual stimuli are secondary insofar as routine learning is concerned. However, the amazing case of Helen Keller serves to demonstrate to what extent and marvelous degree the sense of touch can be developed and utilized in order to sensitize the individual to that with which he has not previously been acquainted; it serves to keep him informed as to any environmental changes which might be taking place, when the usual perceptive avenues are not available for one reason or another.

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Cases are abundant which demonstrate the various locations of neurological lesions, according to my outline. Thus, the peripheral lesions of the optic nerve may be caused by the loss of an eye; peripheral lesions of the eighth nerve can be caused, along with other etiological agents, by an infection of the mastoid cells. Central loss of functioning of the optic nerve can be exemplified by the loss of normal cortical cells which have to do with reception of optic stimuli by the growth of neoplasms or by the escape of brain tissue as a result of a skull fracture which breaks open the cranial vault in that region (the occipital). The same pathology may produce the loss of the central site of auditory function, that is, the brain cells in the temporal area which have to do with hearing.

There remains another part of this classification which needs mention and which involves the concept of the brain cells and their environment without the nervous elements. We are to consider these brain cells as we would liver, muscle, spleen, or any other individual cells of the body. For purpose of discussion, I classify this phase of the subject of the brain cells into two divisions. Thus, there is the endogenous aspect and also the exogenous counterparts. The former has to do with the metabolism within the brain cell itself, while the latter involves the surrounding tissue other than the brain cell. As in any other part of the body, the effect of a change upon the one component will have a tendency to change the physiology of the other member, and vice versa. Thus, any change of the exogenous phase, as in the case of hyperinsulinism with the resulting hypoglycemia, will change the physiology of the endogenous component, or it will change the actual metabolism of the brain cells themselves. Likewise, any atrophy of the brain cells will have a tendency to disturb the equilibrium of the adjacent tissue, or in other words, the exogenous component.

Just a short physiological summary will suffice for the understanding as to how the learning process depends upon the ability of these afferent impulses to reach the corresponding centers.

When an individual sees a chair, it is not the chair which records itself in the cortical tissue. Rather, it is the result of nerve impulses which have been set up by light rays focussed upon the retina. The stimulus, which caused the impulses to travel along the nerve tract, is quite involved and very important. If each impulse

were the same, whether it was brought about by seeing an ant or an elephant, the cortical centers would be unable to distinguish the difference in the stimuli as they enter these areas. Thus, auditory impulses, set up by either an orchestra or by the screeching brakes of a car, would be interpreted as the same in the temporal areas unless these nerve impulses themselves had specific characteristics, either in amplitude or in other characteristic properties.

We know that the "all or none" law applies to any fibre of a nerve tract; that is, the intensity of the impulse is independent of the strength of the exciting stimulus,¹ and that, under normal circumstances, the impulse is conducted along the whole length of the nerve fibre with undiminished intensity. This holds true for a single fibre, but one should remember that the entire nerve trunk may be brought into play by increasing the stimulus. Not alone is the stimulus and the strength of it important, but the time element commands equal attention, and is related to the chronaxia of the tissue; that is, it is a measure for the excitability of the tissue. This impulse in the nerve can be measured by action currents which are connected with an oscillograph or galvanometer so that one can actually measure and record any change of potentials which may occur as a result of such a nerve impulse.

The size of the stimulus, which sets up the nerve impulse, is very important, as more reaction to an increased stimulus is apt to become evident on the recording instruments, and more of an impulse gets through to the receptor cells of the cerebral cortex, if stronger stimuli are given to the afferent mechanisms. It also follows that the more stimuli which bombard these receptor units of the afferent pathways, the more impulses are set up in the pathways and enter the corresponding cortical areas. The effect of seeing 50,000 soldiers march down the street sets up more neural impulses, through the optic tract, than does the sight of a solitary soldier. Here we have the psychology of contrasts. The sight of a landscape done in various hues of grey does not set up as many differences in the character of neural stimuli as does the sight of a modern style of landscaping done in various combinations of yellow, violet and black.

Barcroft² has noted that the spleen of the cat contracts to a greater extent when the stimulus is greater. This point is most im-

portant from an experimental point of view, for we note that the behavioristic school of psychologists does not seem to take much heed of the amplitude of the stimuli which they employ in their experimental work.

From what I have stated, it seems that the greater the stimulus, the greater the response is apt to be in the brain cells, which are apparently the receptors for the afferent stimuli.

Cortical changes associated with neural stimuli

In 1929, Berger³ showed that he could record action currents of the brain and noted that these potentials had to do with memory pictures and other psychological processes which were assumed to have originated in the cortex itself.⁴ These electroencephalograms were influenced somewhat by optic stimuli, according to further investigations of Berger.⁵ He demonstrated that psychic work, as exemplified by attention, which is necessary in order to listen to a lecture, gives rise to definite changes in the cortical potentials. He found that the degree of concentration was just about parallel to the changes which were recorded in the electroencephalograms which he interpreted as being psychophysical in nature and which were associated with consciousness. These changes were under the influence of sensory stimuli. In another paper, Berger⁶ wrote that it had been definitely proved that physiological processes were subordinate to the psychic processes, and in a later communication,⁷ stated that the encephalogram was not influenced by vascular changes. He added a most important point in an additional paper,⁸ when his experimental findings agreed with those of Bishop and Bartley⁹ in that these brain potentials originated from ganglion cells and not from the nerve fibres. This has been confirmed to some extent by Knott and Travis¹⁰ who found that the amplitude and the duration of these cortical potentials apparently had a common factor, probably in the number of cell bodies which discharged to produce the potentials. Travis and Gottlob¹¹ came to the conclusion that human brain potentials have individuality, that is, one man's brain potentials are characteristic for himself as compared with the electroencephalogram of another individual.

The change of brain potentials in infants is highly interesting, since no rhythmic activity of brain waves has been observed over

the occipital region in children before the third or fourth month, according to Smith.¹²

This leads one to speculate that no learning takes place from the sense of sight until about the third or fourth month. I do not mean to infer that the child cannot see before that time; I refer only to the possible time of learning from the perception of sight. It is interesting that the infant learns to accommodate at about that time of life.

The above is interesting in the light of Kreezer's findings¹³ which state that the brain potentials in a child of four years, begin to resemble those of an adult. Whoever has had the opportunity to observe the behavior of such children, will recall that their mental conduct begins to resemble that of adults. In other words, the cortical potentials have been formed by the corresponding cortical centers because of previous sensitizations or learning, and as the result of sensory stimuli, so that these cortical potentials of the four-year-old individual begin to have the characteristics of the potentials which are found in adults.

Since certain cortical areas show these changes, brought about by previous perceptive experiences, it is interesting to consider that certain cases of amentia sometimes possess remarkable powers of observation. Others have an unusual ability for auditory perception. This raises the possibility that certain of the central areas, to refer back to our classification, are deficient in some manner so that the endogenous mechanism does not function—normally, while other cortical areas seem to possess the unusual ability to record and store the afferent impulses which arrive at these unaffected centers.

This inability of certain cortical groups of cells to record and store these impulses may be the basis for such an abnormality as alexia and other related clinical entities. I remember the case of a lad of 18 who appeared to be quite intelligent, yet he could not remember much material which he read. To make a long story short, I advised that he have a friend read his lessons to him. In other words, the process of learning was taken from the deficient cortical centers, which had to do with the sense of sight, and learning was accomplished through stimulation of the auditory areas. He was able to change his grades from "failure" to "good" as the

result of this therapy. His mother and also his maternal grandfather suffered from the same inability to remember that which they had read.¹⁴

I feel that some students learn much better and more rapidly by reading their lessons, while others do better by far in absorbing more information from lectures. In other words, it appears that persons vary in the ability to use certain perceptual pathways in order to transmit and store the material which is to be learned. It follows that educational methods, which treat all individuals alike, appear to be physiologically unsound and should be changed, if these arguments are correct.

Some investigators in electroencephalography, such as Adrian and Mathews,¹⁵ Tonnie,¹⁶ and Kormuller,¹⁷ stated that the brain waves are larger over the occipital region, while Adrian and Yamagawa found maximal activity over the temporal region.¹⁸ None of these observers have mentioned the possibility that their subjects may have had a natural preference for the optic tract over the auditory tract, or vice versa, as the case may have been regarding their natural aptitudes. Perhaps further studies, using cortical potentials, will demonstrate the role of the exogenous or endogenous factors on potentials, such as studies of oxygen tension on cortical cells, which McFarland and Barach have observed in their interesting biochemical studies.¹⁹

Cortical changes and learning

When we measure cortical potentials, it seems that we are measuring the variety and intensity of the waves which are caused by previous stimulations. Since the cortical cells seem to have the ability to record, hold, and recognize these specific afferent impulses, it appears that they possess an exceedingly well-developed state of sensitivity. I am referring to normal individuals.

Since this sensitivity is dependent upon previous reactions from afferent stimuli, it appears that we are entering a specialized field of physiology, namely that of immunology. This constitutes a major portion of our problem, but one which cannot be discussed as thoroughly as it requires because of the lack of space.

It will suffice to state that excessive stimuli of a particular nature or sort, when allowed to act on normal neurocellular tissue, may

oversensitize that individual to an extent that the individual possesses at least a tendency to exhibit psychopathic reactions. Examples of this type of reaction are numerous. The person with a "one-track mind" exemplifies what is meant. Manias may be related to such reactions. Fetishism may be another manifestation of such hypersensitization.

In conclusion, I wish to call attention to the clinical symptoms noted in some patients who show a "surmenage" or emotional discharge, which originates probably from these oversensitized cells. We all have had experience with such individuals. One has only to mention "pet" subjects to such persons, and a definite emotional upheaval takes place. As Dr. George B. Lake puts it, "they emit a sudden flood of emotional heat without intellectual light." I have only to mention the Progressive party to one individual, and he raves and rants on the subject of politics at great length. What I wish to emphasize by this example is that such a person has received definite and specific sensitizing doses of the afferent stimuli to his cortical cells through what he heard or saw from one or another source. Then, when a related psychoallergen is introduced to these cortical cells, a definite release of energy takes place. This may shunt over to the autonomic system, somewhat like the action of a safety-value, and the usual sputtering of speech, flushing of the face, jerky respiration, et cetera, are noted. Word association tests and personality studies, as exemplified by the Rorschach test, seem to introduce associated psychoallergens which have a tendency to set off hypersensitive states caused by these previous perceptual experiences.

I do not have time to discuss the evidence which is at hand for the definite psychosomatic changes which result from these pent-up psychoallergic states.^{20, 21, 22} Nor does time allow for a discussion of the evidence which allows me to relegate such cortical reactions to the field of physical allergy.^{23, 24}

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THE "ONE-CONTACT" CASE

A Problem in Community Psychiatric Practice

BY REYNOLD A. JENSEN, M. D., AND LAUREN H. SMITH, M. D.

In recent decades psychiatry has made rapid strides in developing new concepts of the psychoses, the psychoneuroses, and other mental and emotional phenomena. In the light of these advances it is now possible to define these disturbances more accurately as well as to handle them more effectively in a therapeutic relationship. On this basis procedures and techniques in hospital routines have assumed more definite forms. Concomitantly, concepts are being formulated in dealing with those psychiatric conditions which do not require strict hospital care but which do need help in some way to meet the ordinary demands of everyday living.

There is a definite field for investigation among the psychoneuroses of a mild nature, in which mental and emotional disturbances are severe enough to cripple the personality and relationships of the individual, but not great enough to warrant commitment to, or treatment in a hospital. Therapy for these conditions has made some progress, but as yet concepts about it are not as clear-cut as are concepts of the clinical conditions themselves. Perhaps this is due to the fact that ideas of therapeutics are more emotional, more biased, since they have grown out of personal backgrounds and training. We all ask frequently what is a psychoneurosis, a borderline condition, a symptomatic reaction? We become confused in attempting to formulate our answers. We become even more confused when attempting to answer questions relating to therapy. What is psychotherapy? What forms does it take and which is most beneficial for a given condition?

These questions are only a few of those with which the thinking psychiatrist is concerned. It is admitted that the psychoneuroses do receive benefit from psychotherapeutic procedures and a general need for them is recognized. But if further progress is to be made, our clinical research must continue.

Paralleling these advances in psychiatry briefly mentioned above, the Pennsylvania Hospital has developed progressively in its interest and work in this field. From the day the charter of the

hospital was granted by the assembly of the province of Pennsylvania in 1751, the institution has been interested in the care and treatment of psychiatric disorders. Out of the experience of the hospital in its mental department grew the recognition of a need to transmit to the community the lessons learned from the mentally ill in order to help people suffering from the psychoneuroses and borderline conditions. This led to the creation of a unit of that hospital (The Institute of the Pennsylvania Hospital), for the purpose of diagnosing the problems of, and caring for, that vast group of people who have mental and emotional difficulties but who are not considered psychotic or disturbed to the degree that they require intensive mental hospital care and treatment.

The institute conceives its main function to be that of treating adult patients who are suffering from mental and emotional disorders commonly referred to as the psychoneuroses. In addition to the above, it offers consultation service to the city of Philadelphia and surrounding territory. It provides a psychological and vocational guidance service for those who desire it. It is interested in the study of these cases with the hope that out of this study will grow an appreciation and understanding of those forces and factors which produce maladjustment in the lives of so many people. In this sense it endeavors to serve as a center for the promotion of a program of mental hygiene.

The institute began to function in 1930, dividing its work into two classes: inpatient and outpatient. The latter is considered its more vital function in relation to the community at large.

The outpatient department operates on an appointment basis, giving a full hour interview to each patient and as many subsequent interviews as are necessary for his welfare. In addition, whenever diagnostic physical and laboratory studies have not been done and are deemed necessary, they are made. Although it is over 75 per cent a free or part-pay project, each individual receives the same time and attention as would a patient seen in the office of a private psychiatrist. In this sense the clinic and private cases parallel each other. Therefore, studies of one group may throw light on the problems encountered in the other.

Up to this time two studies have been made on this case material.^{1,2} The first translated the work of the clinic as it applied

to general practice because so many of the patients seen were of the type commonly encountered by the family physician. The second outlined the experience of the clinic with the general run of patients seen and the types of psychotherapy that were apparently of the greatest practical use. In these studies the psychotherapy of the outpatient department was found to fall more or less accurately into six groups:

1. Orientation, consultation.
2. General psychotherapy.
3. Reeducation.
4. Deep psychotherapy.
5. Modified psychoanalysis.
6. Psychoanalysis.

This third study is concerned with those patients who had only one contact with the institute. In a later investigation a similar study of those patients who took advantage of continued interviews and prolonged treatment is to be completed. The scope of this paper, then, covers only one-contact cases during the period 1930-1935, inclusive.

During the first six years of the institute's existence, over sixteen hundred patients were seen in the outpatient department. The records of 386 patients who were defined as one-contact cases, were studied and are reviewed here.

By definition, a one-contact case is one in which the patient was seen only once by a psychiatrist or psychologist. In some instances the patients were seen by both the psychiatrist and psychologist during the same visit. While in this sense there were two interviews, there was only the one contact with the institute. In general, what we wanted to know was—Who were these patients?—What kind of difficulties did they present? How did they get to the institute and what happened afterward?—In what way does a psychiatric consultation clinic render service to the community?

Specifically, we were interested to learn: the number of males in comparison with females, the age distribution, the source of referral, the marital status, the character of the patients' environments, their economic status, the physical conditions which some presented, the problems necessitating their coming to the institute,

the tentative diagnoses established on the basis of just one interview, and the outcomes and dispositions made. The last consideration is most important: namely, to discover why this number of patients had only one contact with the institute, what number were not acceptable to the outpatient department and why, how many refused the service of the institute, and how many seemed interested in continuing contact after the initial visit but did not keep their appointments for further visits. In addition we were interested to learn what was recommended for those patients who were not acceptable for the facilities the institute had to offer.

Certain correlations may be impossible because in some instances records were lacking in one or more of the details in which we were interested. Other deficiencies in records may have been due to the fact that often it was impossible to secure in only one interview all the desired information. Other things producing inaccuracies in records were the problems of organization of the early days of the institute and the unfamiliarity of the staff psychiatrists with the routine information needed to develop a study of this type.

Within these limitations we have attempted to evaluate each of the above and report our findings, recognizing that there are gaps in the survey. We believe that out of this study emerge some findings of interest and value.

A total of 386 records were studied. This represents 23.4 per cent of the total number of outpatients seen during the six-year period from 1930 to 1935, inclusive.

Sex Distribution

Distribution by sexes was approximately equal:

Male.....	190	Female.....	196
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Age Distribution in Years

Eighteen per cent of the total number of single-contact cases were children between the ages of 1 and 15 who were seen chiefly for psychological testing rather than for treatment. Two hundred thirteen cases, or over 55 per cent, were between the ages of 16 and 40, showing that the greatest service is rendered to individuals in the earlier, more productive years of life. Twenty-one cases, or 5

per cent, were between 51 and 70 years old, the involutional and senile stages of life. In 29 cases age was not recorded.

1-15	16-20	21-30	31-40	41-50	51-60	61-70	Age not given
70	46	98	69	38	18	3	29

Source of Referral

One hundred eighty-three patients, or 47.4 per cent, were referred from medical sources. Nearly two-thirds of these patients came from physicians in private practice. The remainder came from hospitals and other clinics.

Eighty-four patients were referred by nonmedical agencies. These organizations included social service agencies, schools and colleges, city and state departments such as the department of labor and rehabilitation and the juvenile court, and organizations such as the Y. W. C. A., and the Lutheran bureau.

Thirty-two cases were brought by some relative; 23 came of their own accord; while 39 were referred by friends.

Study of the sources of referral year by year reveals an increasing number from medical sources and other agencies, with a diminution in the number coming from family, friends, or by themselves. The policy of the institute is to accept cases only through referral by a medical or agency source. It is highly desirable to have all possible factors of a physical or organic nature ruled out before psychiatric treatment is begun.

Medical	Agency	Family	Self	Friend	Not given
183	84	32	23	39	15

Reasons for Referral

We can say with reference to reason for referral that those patients coming from doctors and medical clinics were sent for consultation and/or treatment; those from agencies came, in the main, for psychiatric or psychological opinions and recommendations for further plans. Family, friends, and individuals coming of their own accord were interested generally in treatment.

Patients' Reasons for Coming to the Clinic

In 60 cases we found that the patients definitely expressed a desire for help. Characteristic examples are: "Do I need to be analyzed?" "How can I get fixed up so I can get back to work?" "Why am I so fearful and anxious all the time?" One amusing

case showing what can happen was an individual who came for help because of a skin condition which he feared was syphilis. It proved to be scabies. Forty indicated that they themselves had no reason for coming to the clinic but were sent or brought there. We have no information on the others.

Place of Residence

As would be expected, a total of 280 patients, or 72 per cent, lived within the city or environs. Forty-seven lived in small towns, 14 lived in the country, and 12 were in institutions. For 33 patients the place of residence was not recorded.

Urban	Suburban	Small town	Country	Institution	Not given
217	63	47	14	12	33

Marital Status

At first glance it would seem from the following figures that by far the greatest number of one-interview cases were single. However, we must not lose sight of the fact that a total of 70 patients were under 15 years of age and, of course, unmarried. This reduces the number of single patients of marriageable age to 147 as compared with 122 who were married. But when we add to the group married at the time of their contact with the institute those who were married at one time but who were widowed, separated, or divorced, the two groups almost balance one another. In other words, we have 147 patients who were single and 151 who were or had been married—an approximately equal distribution.

Single	Married	Widowed	Separated	Divorced	Not given
217	122	14	8	7	18

Economic Status

We had no absolute standard for determination of economic status. Our classification is an arbitrary one based on such factors as unemployment, inadequate incomes in the light of the number of dependents and outside obligations, the rate of charge reported in the institute records—in general, the total picture of the case as we could reconstruct it. By and large the group classed as “poor” were living on a relief standard, although some were self-supporting. Those in the “fair” classification had incomes sufficient for necessities but few, if any, luxuries. The individuals in the group

described as "good" had salaries approximating those of lower-income professional workers.

Poor	Fair	Good	Not given
244	81	23	38

Occupational Status

It is significant that 117 of the one-interview patients were unemployed at the time of their visit to the institute. Many of them had not been employed for a period of a year or more; many were on the relief rolls of the community in which they lived. Considering only the total number of patients who were more than 15 years of age, or 316, we find that 37 per cent of the adults represented in our survey were unemployed.

Seventy-six of our patients were students in elementary or secondary schools, or in some institution of higher learning. Many of the 68 housewives were from very modest or poor homes. Fourteen individuals were engaged in unskilled labor, while 10 were skilled laborers; 10 were salesmen; 14 office employees. Six patients were professional people—four teachers, one social worker and one physician. Seven were inmates of institutions. Eleven children were not in school. This group included children too young to be in school at the time of the institute visit, as well as a few defectives who may have attended school for a certain period but were not in school at the time of the interview. No information concerning occupational status was given on 53 of the cases.

Occupational Status

Unemployed	117
Students	76
Housewives	68
Unskilled laborers	14
Skilled laborers	10
Salesmen	10
Office employees	14
Professional people	6
Inmates of institutions	7
Children not in school	11
Not given	53

Educational Status

No formal education	8	
Children in elementary school	49	
Adults who left school at:		
Grade 1	2	
Grade 2	2	
Grade 3	2	
Grade 4	2	
Grade 5	3	
Grade 6	4	
Grade 7	4	
Grade 8	21	
	—	40
Secondary school:		
1st year High School or grade 9	9	
2nd year High School or grade 10	14	
3rd year High School or grade 11	7	
4th year High School or grade 12.....	27	
	—	57
Some college work	14	
College graduates	10	
Graduate degrees	7	
Teachers college	4	
Special school	13	
Not given	184	
	—	386

Under the listing of "no formal education" are included children who were too young to be in school at the time of the interview as well as a few defectives who never attended school. Forty-nine children were in elementary school at the time of the interview. The group of 40 patients listed under grades 1-8 inclusive were adults whose education was terminated at the levels indicated. The high school and college tabulations represent adults who left school at the various levels indicated as well as pupils who were in school at the time of our contact. Thirteen patients had special training such as business or trade school.

The 35 patients in the upper educational bracket included: 14 who had had some college work, 10 university graduates, 7 with advanced degrees, and 4 graduates of teachers' colleges.

Diagnostic Impression

Diagnosis of mental and emotional disorders frequently presents difficulties even under the controlled conditions of hospitalization which provide opportunity for more careful observation and study. The task is even more complex when the patient is seen once in a clinic for little more than an hour.

It is true that an unpublished study made several years ago by a group of physicians interested in comparing first impressions with final diagnoses showed a correlation of slightly better than 60 per cent.³ Yet other similar studies on a wider scale are necessary to establish a truly reliable corollary. Because of the possibilities of error in any opinion based on one interview, we have, therefore, designated the conclusions as "diagnostic impressions" rather than as "diagnoses." For some patients, notably those for whom institutional care was recommended, it may be assumed that the diagnosis was reasonably accurate.

Psychoses	88
Questionable psychoses or neuroses	14
Psychoneuroses	107
Organic conditions	27
Sex problems	8
Alcoholism	9
Speech difficulties	3
Behavior problems	23
Mental retardation	38
Average mental capacity	24
Superior mental capacity	6
Average child or adult	8
No impression given	31

386

As the table shows, 88 patients were judged to be truly psychotic, while 14 were borderline cases which may have been either early psychoses or severe psychoneuroses. One hundred seven patients were diagnosed as falling definitely into the class of psychoneuroses. Twenty-seven cases presented signs and symptoms indicative of some underlying physical or organic condition rather than of a mental or emotional difficulty: (brain lesions, 3; Parkinsonian disease, 1; encephalitis, 4; juvenile paresis, 1; cerebral birth palsy,

3; congenital deficiency, 1; convulsive disorders, 7; cervical rib, 1; scabies, 1; endocrine disturbance, 1; gonorrhea, 1; multiple sclerosis or myasthenia gravis, 1; tuberculosis, 1; genito-urinary disease, 1). Within the group designated as sex problems were five overt homosexuals, two cases of frigidity and one of incompatability. The cases of alcoholism and speech disorders are self-evident. No further diagnostic impression other than "behavior problem" was recorded for the children having difficulty in one way or another in making an adequate adjustment in the home, school or community. On the basis of psychological testing, 38 children who were classified under "mental retardation" fell within or below the group commonly regarded as feeble-minded. Twenty-four were of average mental ability, while six were classified as of superior mental capacity. Eight patients were considered to be "average persons." No impression was recorded in 31 cases.

PSYCHOSES

Schizophrenia	35
Manic-depressive	15
Involucional psychoses	8
Senile psychoses	5
Psychoses with central nervous system lues	4
Psychoses with cerebral arteriosclerosis	3
Psychosis with Huntington's chorea	1
Type undetermined	17

 88

The group of 88 patients who were diagnosed as psychotic show an interesting distribution. Thirty-five were deemed schizophrenic, 15 were classified as manic-depressives, while 8 presented symptoms suggestive of involucional psychoses. Five were believed to be suffering from definite senile psychoses, three were psychotic with evident manifestations of cerebral arteriosclerosis and four were psychotic with history and symptoms suggesting central nervous system syphilis. There was one case of psychosis with Huntington's chorea—a relatively uncommon condition. Seventeen were judged to be psychotic although the type remained undifferentiated.

PSYCHONEUROSES	
Reactive depression	23
Anxiety state	22
Neurasthenia	9
Hysteria	7
Psychopathic personality	6
Paranoid trends	4
Psychasthenia	4
Obsessive compulsive state	2
Traumatic neurosis	1
Hypochondriasis	1
Type undetermined	28
<hr/>	
	107

Of the 107 patients judged to be suffering from neuroses, the largest number belonged to the group classified as reactive depression. Twenty-three were in this division. These patients were struggling with some reality situation which was confronting them. Seventy-two were believed to belong to the group of anxiety states. This classification has not been broken down further into anxiety hysterias and other more specific identifications commonly employed, as more than one hour would ordinarily be necessary to do that. Nine fell in the neurasthenic group, while seven were believed to be suffering from hysteria in the classical sense of the term. This is a slightly larger number than one would ordinarily expect. Six patients were judged to fall into the category of psychopathic personalities. There were four each of psychasthenia and neuroses with paranoid trends. Two were obsessive compulsive states with one case each of traumatic neurosis and hypochondriasis. It is admitted that psychopathic personality, paranoid trends and hypochondriasis are not official classifications but we have felt justified in using them as we are considering only diagnostic impressions. Twenty-eight patients presented symptoms suggestive of a neurosis but no more precise classification was attempted.

Outcome and Disposition

Sixteen patients stated definitely that they would not consider further contacts with the clinic. In every instance we found that the patient had come under duress. The usual excuse was either that they did not feel the need of such service or that they wished to continue under their own doctor's care.

Of the 99 who were given a second appointment, some might not have been acceptable to the clinic. In certain instances an additional appointment was made with the hope of getting a more complete picture before reaching a diagnosis. A few of the cases classified as psychotic were in this group. However, many would have been acceptable for therapy. Their failure to return raises several questions which will be discussed later.

Eleven stated definitely that they were helped sufficiently by one interview and were confident that they would be able to handle their difficulties. For example, one patient, a young man in his twenties, was engaged to be married. In his fiancée's family there was a history of mental disease. He was willing enough to proceed with marriage plans, but his fiancée felt they needed information which would help them to work out their problems.

In another instance a teacher in one of the colleges in the community came seeking help. It was early in the first year of her appointment. She was having trouble in making an adjustment and had no one in whom she could confide. She came to the clinic, talked over her difficulties, and following one interview felt she could go back to her tasks without further help.

In 28 cases we found no record of the disposition.

Two hundred twenty-seven, or roughly 58 per cent, were not acceptable for treatment in the clinic. These rejections include those patients who were psychotics, children under 15 years of age, those who came only for psychological testing or vocational guidance, those suffering from an organic condition, and several patients who for various reasons could not, in the opinion of the psychiatrist, benefit from therapy.

OUTCOME AND DISPOSITION

Patients refused to return for further interviews	16
Patients were given appointment but did not return.....	99
Patients were helped by one interview	11
No record of disposition	28
Not acceptable following one interview	227

Disposition of Cases Not Accepted

In all cases referred by a physician, clinic, or agency the patient was sent back and a report made giving details of the interview, diagnostic impressions and recommendations.

Institutional care in a city, state or private mental hospital or institution for the mentally retarded was recommended for 83 patients.

Of the 51 who came for psychological testing or vocational guidance only, the majority were children and as such, outside the scope (at that time) of the institute's further service. Institutional care was suggested for six of these children because they were mentally retarded. As an example of an adult case, the S. P. C. C. was consulted to provide care for the children of one patient, a delinquent mother, who was sent only for a psychological test.

In the group of 27 diagnosed as organic conditions, 17 were believed to need further medical study and this was advised. Treatment was recommended for the others.

A change of environment was recommended for eight individuals.

Eight patients came from distances too great to enable their visiting the clinic with any degree of regularity. Therapeutic procedures for care were suggested to their physicians.

Seven children were referred to the Philadelphia Child Guidance Clinic for help.

In four cases direct psychotherapeutic procedures seemed inadvisable because of the nature of the problem. Instead, arrangements were made to have the patients admitted to either the physiotherapy or occupational therapy departments at the institute.

Three individuals, under the care of private physicians but not referred by them, were not accepted. The institute accepts such patients only on medical referral.

Two patients were recommended to a psychiatrist in private practice. One of these with a speech disorder presenting a particular problem was referred to a specialist in this field.

In the miscellaneous group of 34 were 19 for whom it was impossible to ascertain from the records the specific recommendation, although the patients were sent back to the referring agency. The 15 others included such cases as a woman who asked help in removing her mother-in-law from the home, a man who spoke only Italian so that there was no medium of communication, and a number who seemed to be suffering from no mental or emotional disorder.

DISPOSITION OF CASES NOT ACCEPTED

Institutional care recommended	83
Psychological testing only	51
Medical study or treatment recommended	27
Change in environment recommended	8
Residence out of city	8
Referred to child guidance clinic	7
Physio- or occupational therapy recommended	4
Referred back to local doctor	3
Referred to private psychiatrist	2
Miscellaneous	34
	<hr/>
	227

Followup

As would be expected with a large group of one-contact cases, we have actual followup reports on unacceptable cases only in isolated instances. However, we did find in the records that 16 patients for whom institutional care had been recommended were finally admitted to mental hospitals. Two patients presenting symptoms suggesting a brain lesion were operated on and brain tumors were found. The case suspected of tuberculosis was studied in a hospital here in the city and the report was "probable tuberculosis." One patient was later committed to an industrial school and one was reported as having recovered from his illness.

Admitted to mental hospital	16
Postoperative report of brain lesion	2
Reported tuberculosis suspect	1
Committed to industrial school	1
Reported recovery	1

General Discussion

Out of this study emerge several items which merit comment.

In surveying this material we were impressed with the large number of adults who were faced with marked socioeconomic insecurities or with routine tasks which seemed to offer little opportunity for expression of individuality. We all recognize the effect which such situations have on personalities. It seems well, however, to emphasize its importance and to call attention to the fact that psychiatry as one of the branches of medicine may eventually be concerning itself with social and economic changes that may reduce these pressures that are so vital in our everyday world.

Of the group of 386 one-contact cases, 99 were given a return appointment but failed to keep it. This is a significant "mortality," the reasons for which are difficult to evaluate. We offer several for consideration.

The question of adequate preparation of the patient by the referring person or agency seems to be of paramount importance. Psychiatric techniques are different from those usually employed in medical practice, be it private or clinic. The patient being unprepared and therefore unaware of this fact comes to the psychiatric clinic anticipating the usual medical procedures only to find it much different from their expectations. Evidence of this state of affairs is common to those who have had numbers of patients request medicines, pills, et cetera, which have been given them previously. It is our impression that the loss of some of this group may be accounted for by lack of preparation. We would suggest that anyone referring a patient to a psychiatric clinic could be of real help, not only to the patient himself but to the clinic as well, in giving a reasonable explanation of these differences which exist. Without such preparation both clinic and patient are placed at a disadvantage.

We are likewise mindful of the responsibility of the psychiatrist in handling the difficulties inherent in the initial interview. Was the psychiatrist successful in establishing rapport? Did he attempt to do too much or move too fast? Did he take the necessary time to offer adequate explanation of these differences to the patient? Was he mindful of the patient's situation with all his attendant anxieties and apprehensions? Did he remember that many of these patients were sent to the clinic rather than came of their own volition? In the light of our findings further study on the problem of the first interview is indicated to determine ways and means of developing increasing skills to reduce this "mortality."

Finally we were impressed in this survey to note that of the 386 records studied, more than two hundred were either not acceptable to the institute or refused the service which that organization had to offer. The institute did little more than make a diagnostic study of these cases, yet in so doing it rendered a service to the medical profession as well as to the social agencies of the community in offering certain recommendations and plans for the care of

these patients. By providing such plans, stresses and strains within family life as well as within community life might have been either eliminated or reduced. In this sense the institute perhaps has served as a distributing center making lighter the heavy load of the busy practitioner and social agency. This survey establishes beyond question the wide community use of the facilities which such an organization offers in an outpatient department.

Conclusion

As a clearing house for a variety of mental and emotional problems a psychiatric outpatient clinic necessarily receives for single-interview study and consultation many individuals whose needs do not properly come within the scope of its continued services. Undoubtedly this would always be true of a specialized clinic. Yet in its reports to referring agencies and physicians on those cases not acceptable for continued treatment, it has been able to make recommendations regarding institutional care, to confirm diagnoses, or to suggest possible avenues of further study.

This survey of one-contact cases over the years 1930-1935 shows the wide community use of the facilities which a psychiatric outpatient clinic has to offer.

The greater use of the psychiatric clinic for patients needing continued psychotherapy will be presented in later studies.

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THE EFFECT OF INSULIN HYPOGLYCEMIC SHOCK THERAPY ON HEPATIC FUNCTION

BY L. LARAMOUR BRYAN, M. D., AND GEORGE C. BOWER, M. D.

During the course of insulin therapy for the treatment of schizophrenia, the authors noted blood sugar determination of 18 mg. per 100 cc. of blood while others have reported even lower readings. Since the liver is thought to be the largest storehouse for glucose it is undoubtedly called upon to liberate large amounts of glycogen during the hypoglycemic state. Because of this we felt that liver function tests were indicated in order to determine if there was any evidence of liver damage following insulin hypoglycemic shock therapy.

PERCENTAGE OF DYE EXCRETION FROM BLOOD

Patients	Before treatment	After treatment
S. B.	100	90
G. T.	100	100
B. H.	100	95
V. E.	100	100
H. H.	100	85
H. A.	75	88
H. R.	85	100
E. T.	90	90
W. J.	92	91
B. E.	95	92
O. C.	88	93
G. J.	85	92
T. M.	95	97
D. H.	95	95
M. E.	94	92
T. H.	100	100
D. J.	96	100
C. B.	75	82
H. R.	90	100
V. M.	100	98

For this series of tests we used the bromsulphthalein dye test which consists of an intravenous injection of bromsulphthalein and the withdrawal of a specimen of blood 30 minutes later. Injections of 5 mgm. of the dye per kilogram of body weight were employed.

Following the withdrawal, and clotting of the blood, the clear serum was removed and colorimetric examinations were made to determine the presence and, if present, the percentage of the dye. Ten per cent, or less, of dye retention was considered normal.

Reported here are the results of a series of tests upon 20 patients. The average aggregate amount of insulin was 6,414 units. The maximum dose of insulin varied from 30 to 450 units. The average duration of treatment was 65 days. The first test was carried out the day preceding the institution of insulin shock therapy, the second was performed at the conclusion of treatment.

Urobilinogen determinations were performed daily on the urine of all patients undergoing treatment to determine any evidence of incipient liver damage. An occasional excess was noted but this was transitory and of no apparent pathological significance.

We realize that the present series of cases is small but from our observations only one of the 20 cases showed any evidence of impaired liver function following treatment and in this case the damage was only slight. Several cases showing some impairment of liver function before treatment was instituted, apparently improved under treatment. We expect to continue our investigations and hope to confirm our present findings in a report on a larger number of cases.

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INDUCED HYPOGLYCEMIC SHOCK IN CRYPTOGENIC EPILEPSY

BY GRANT E. METCALFE, M. D.

Early in the author's application of the hypoglycemic shock therapy to schizophrenics, the subject of convulsions occurring during the hypoglycemic state became of interest. This led to speculation concerning the response of epileptics to induced hypoglycemia. It was felt that possibly the hypoglycemia acted upon the vegetative-endocrine system and in turn might exert some influence upon epilepsy. Yakolev¹ has shown that during the epileptic seizure the autonomic regulation of the energy metabolism of the body is disturbed and recently Gellhorn² observed that induced hypoglycemia produced excitation of the sympathetic nervous system.

Survey of the literature led to the conclusion that in the majority of epileptics, the blood sugar levels reported in large series of cases, as those of Weeks, Renner, Allen and Wishart,³ Lennox, O'Connor and Bellinger⁴ and others, while within normal limits, tended toward a low normal although there is a wide variance of conclusions. Neilsen,⁵ Tyson, Otis and Joyce⁶ felt that there was a tendency toward hypoglycemia in patients with epilepsy. The rise in blood sugar level as the result of the convulsion was observed by Osnato and Killian,⁷ Haury and Hirschfelder⁸ and Minchin.⁹ The last author concluded that immunity from seizures in the postconvulsive state was associated with this phenomenon.

Baudouin, Azerod and Lewin,¹⁰ Ziskind,¹¹ and Pollock and Boshes,¹² who administered insulin to epileptics in doses ranging from 10 to 60 units (in most instances only a single administration) reported extremely low blood sugars (as low as 16 mgm. per cent) approximating the levels obtained in the comas of schizophrenic subjects receiving hypoglycemic therapy. They did not observe a single convulsive manifestation or coma. Their findings tend to bear out part of the experimental work of Hrubetz¹³ who found that insulin in sufficient doses to reduce the blood sugar to "zero" (the nonfermentable reducing substances in the blood range from 15-20 mgm.) did not produce convulsions in normal rats. However "shock" dosage did produce seizures in 2 per cent with smaller doses and in 90 per cent in larger doses.

In view of the relative infrequency of convulsive manifestations in schizophrenics in the course of treatment (in the phase that would correspond to the one the above observer induced) and the lack of ability to readily predict seizures in schizophrenics during hypoglycemia, it was this author's opinion that previous statements that convulsions did not occur in insulin induced hypoglycemia, in epileptics, were erroneous. At any rate, it was felt that an investigation of this phase of carbohydrate metabolism was worth undertaking and reasonably safe.

After the completion of this study the translation of Zolliker's¹⁴ article reporting on the administration of hypoglycemic shocks to epileptics appeared. In eight of his patients only phase I was carried out, as described by Sakel,¹⁵ but 18 subjects were carried to the stage of deep shock (three hours of hypoglycemia). In individual cases shock was induced as many as six times. There was no change in the therapeutic régime of the patients, sedative medication being continued.

METHOD OF PROCEDURE

The material available being limited, insulin hypoglycemia was administered to six subjects with epileptic psychoses—four men and two women. All but one of these patients were allowed to proceed to deep coma. (Because of his age and other factors, this patient was not allowed to undergo severe hypoglycemic shocks.)

The initial dose was 10 to 20 units of U80 insulin. The maximum dose, 400 units, was administered to a patient who was overactive and noisy during hypoglycemia, in an attempt to quiet him. The minimum dose producing deep coma was 140 units, the average, 164 units. However it did become necessary to increase virtually all doses to maintain deep coma and the maximum dose ranged from 160 to 400 units. It should also be mentioned that sensitivity was observed requiring decrease of dosage. The dosage for the women was increased rapidly and that of the men more gradually.

Clinical manifestations of hypoglycemia were observed to follow doses which varied considerably and had no relation to blood sugar values, as has been observed in schizophrenic subjects.

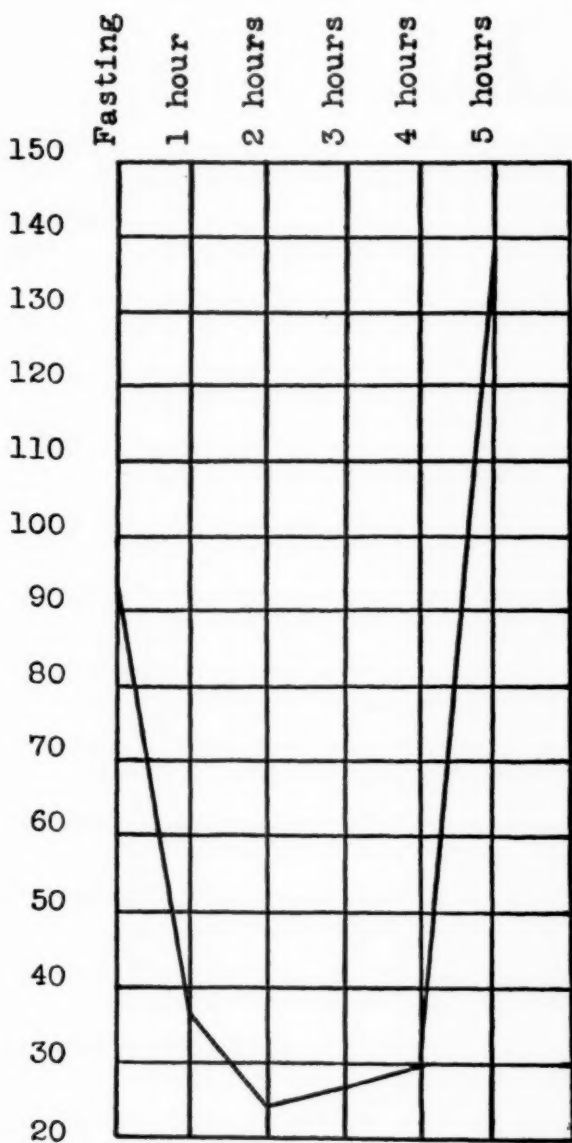
Hypoglycemic states of approximately four hours duration were induced five times weekly, 389 in all—21 and 26 in each of the two women; and 78 to 93 in each of the four men. Two of the men were placed on 20 units after 48 and 50 shocks, the other two after 72 and 73 shocks. The first two received 20 units 30 times, the others 20 times. At this writing they are receiving what corresponds to phase IV as outlined by Sakel, but this administration is being continued beyond the customary few days. The patients receive, daily, 15 to 20 units of insulin, one hour before the morning and evening meals.

OBSERVATIONS

All the patients had convulsive manifestations during hypoglycemia. Most of these were observed with coma doses. During 389 hypoglycemic states, 25 convulsions were observed—6.4 per cent. The usual somatic changes observed in schizophrenics were noted, except that when they received smaller doses, the tendency to perspire was not so marked in the epileptics.

The range of the fasting blood sugar level was between 52 and 154 mgm. per cent with an average of 93.2 mgm. per cent. Blood sugar determinations were made in the fasting state, previous to the administration of insulin and at the end of one, two, three and four hours of hypoglycemia, as well as one hour after the interruption of the hypoglycemia by the administration of carbohydrate. It is of interest to note the low levels obtained at the end of the first hour with doses of insulin as small as 10 units—in two instances 30 mgm. per cent. Table No. 1 shows the relation of blood sugar level to insulin dosage (averages) and the graph depicts the composite blood sugar curve.

With increasing doses of insulin, the level of blood sugar remained lower during the remainder of the hypoglycemia. This confirms the views of Zolliker¹⁴ in that there appears to be a certain connection between the dose of insulin and the blood sugar curve and that no intermediate peak is noted as in schizophrenic subjects. In practically all instances, the rise after carbohydrate administration, as observed an hour later, showed a relatively prompt response.



Graph showing average blood sugar curve

TABLE 1. RELATION OF BLOOD SUGAR LEVEL TO INSULIN DOSAGE (AVERAGE)

Units insulin	Blood sugar level in mgm. per cent					
	Fasting	1st hour	2nd hour	3rd hour	4th hour	5th hour
10	89	53	47	49	61	98
20	85	24	42	43	55	133
40	93.6	54.5	36	36	41.8	137
50	96.8	53.7	35	31.7	32	135
60	80	19	27	30.7	29.5	195
70	77.7	15	17	15	16	107
80	81.7	37	15.7	33.5	19.5	70
90	76	24	15	15	15	152.7
100	97.7	35.7	15	15	15	124
120	92.5	17	16	17.5	17.5	140
140	77	50	15	15	15	65
160	93	30	15	25	50	163
190	103.5	18.5	15	24	24	131.5
225	128.5	31.5	15	15	55.5	171.5
230	101	16	15	16	15	163.7
250	102	33.5	15	15	15	86.8
300 and over	92	27	15	15	18	187

The patients showed psychic changes during hypoglycemia. Specifically there was observed surliness, resistiveness, restlessness, assaultiveness, incoherent mumbling, infantile behavior including sucking and other oral movements and in two cases wild maniacal behavior with definite response to hallucinatory experiences (religious). Practically all of these phenomena disappeared after the passage of the confused state noted, in awakening from the coma. The two patients who were particularly surly, resistive and assaultive, became less so after the advent of coma and this disappeared entirely when blood sugar specimens were not taken.

It is the author's opinion that most of the patients became much clearer mentally and more cooperative with the progress of insulin administration. Possibly this may have been due to the fact that the patients received no sedative medication during the course of this investigation.

The effect of the induction of hypoglycemic shocks on the frequency of the seizures was made one of the major objectives of this investigation. As has been noted, only 25 convulsive manifesta-

tions were observed during hypoglycemia. This small number following 389 injections of insulin leaves little doubt but that seizure provocation by insulin is, at the most, slight. These figures compare favorably with those of Zolliker,¹⁴ who felt that the patients should be under the influence of a sedative, whereas this group of cases received no sedative during observation. When considering this point, it must be remembered that the closest possible to a "zero" blood sugar reading was obtained. Many of our specimens were actually reported as being below 15 mgm. per cent. Accuracy below this level being questionable, they were recorded as 15 mgm. per cent.

In general, the observations of Hrubetz¹³ are, at least partially, confirmed, in that the majority of the seizures took place while the patients were receiving coma doses.

Ziskind's¹¹ observation that the same number of convulsions could be produced with superhydration are of interest. There did not appear to be any connection between the convulsions observed during hypoglycemia and fluid intake in this series of cases.

The following table shows the frequency of seizures during the period of observation as compared with a similar period prior to observation. The latter figures were obtained by taking an average for the 12 months preceding. During this time, the patients received sedative therapy, chiefly in the form of phenobarbital.

TABLE 2. FREQUENCY OF SEIZURES DURING OBSERVATION

Patient	Period of observation in days	Number seizures before treatment	During hypoglycemia	Outside hypoglycemia	Total during observation
Male					
No. 1—J. R.	134	73	3	67	70
No. 2—H. O.	111	3	3	1	4
No. 3—F. O.	111	25*	2	32	34
No. 4—Jos. R.	134	unknown	5	6	11
Female					
No. 5—V. S.	36	102	6	21	27
No. 6—J. C.	36	31	6	6	12
	562	334	25	133	158

*This patient has parole of grounds and is known to have had seizures not recorded in the previous year.

During the period of observation, but outside of hypoglycemia, it was observed that the frequency of seizures was less in all cases except case No. 3. During the period when the male cases received 20 units, 100 hypoglycemic periods were induced and only one patient had a convulsion. Outside of hypoglycemia, a total of 23 seizures were observed as compared to 37 for the control period. Similarly with an average observation period of $18\frac{1}{2}$ days, during which administration of insulin corresponded to a prolongation of phase IV of Sakel, seven seizures were observed as compared to 15 for the control period. However, with the prolongation of the observation period, two weeks longer, it was noted that patient No. 3, who had not been placed in coma had 15 seizures. The patient for whom there was no prolonged control period of observation (Patient No. 4), had no seizures during these periods of small insulin dosage.

If the seizures during hypoglycemia are included in the convulsive manifestations observed, it will be noted that, where there is an increase, it is not great. For all practical purposes one can assume that the frequency of seizures was changed very little in these cases. Those patients showing an increase, or very little change, were subjected to more comas than the patients not showing such an increase. There were approximately twice the number of seizures in hypoglycemia with coma doses as illustrated by the following table.

TABLE 3. RELATION OF SEIZURES TO COMA DOSE

Patient	Convulsions with subcoma doses	Convulsions with coma doses	Coma dose: units of insulin
Male			
No. 1—J. R.	0	3	230-260
No. 2—H. D.	2	1	250
No. 3—B. F.	2	0	not in coma
No. 4—Jos. R.	0	5	300-400
Female			
No. 5—V. S.	2	4	140-160
No. 6—J. C.	2	4	150-160
	—	—	—
Total	8	17	

COMMENT

With such a small number of cases, it is difficult to make any conclusions as to the therapeutic value of insulin in the convulsive disorders. It does appear, however, that further investigation of the use of insulin in epileptic subjects is justified, with this point in view.* The convulsive manifestations do not appear to be dangerous and are readily controlled. The seizure frequency, even without accompanying sedative medication does not appear to be greatly increased.

This investigation differed from others along similar lines known to the author, in that:

1. Higher insulin doses were administered.
2. A greater number of hypoglycemic states and comas per patient were induced.
3. Each patient was subjected to approximately four hours of hypoglycemia each time that insulin was administered.
4. All but one patient was in coma several times.
5. The patients received no sedative medication.
6. A prolonged phase IV of Sakel was carried out.

CONCLUSIONS

1. The insulin tolerance of epileptics has been determined on a small group of epileptics to a degree not known by the author to have been achieved previously.
2. Seizure frequency was not markedly increased with coma doses and appeared to be decreased with smaller doses resulting in four hours of hypoglycemia, as well as when insulin was administered twice daily, an hour before meals.
3. The four patients most intensively treated, appeared to be much improved mentally.
4. The physical and psychic phenomena observed during hypoglycemia are analogous to those observed in schizophrenic subjects.
5. The dosage necessary to produce coma varies as greatly as in schizophrenic subjects.

*A communication from W. G. Lennox informs me that it is possible to favorably influence seizure frequency in certain cases of petit mal epilepsy by the administration of small insulin doses followed by carbohydrate.

6. The six patients experienced 389 periods of hypoglycemia with only 25 instances of convulsive manifestations—6.4 per cent.

7. All but one of the patients gained weight, the maximum gain being 34.5 pounds and the average being 14.6 pounds.

8. Clinical manifestations and blood sugar levels did not parallel one another. With larger insulin dosage the blood sugar curve was maintained at a lower level longer than with schizophrenic subjects, with no intermediate peak.

9. Further investigation of this phase of carbohydrate metabolism in epileptics, seems desirable.

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MODIFICATIONS IN THE INSULIN TREATMENT OF SCHIZOPHRENIA

BY DAVID RUSLANDER, M. D.

Over two years have elapsed since Sakel demonstrated his technique for the insulin treatment of schizophrenic patients to a group of representative psychiatrists at the Harlem Valley State Hospital. Subsequently this technique was introduced generally throughout the State hospitals of New York. However, it was inevitable that certain modifications of this original technique would be introduced by those engaged in this work for any prolonged period of time.

At the Buffalo State Hospital certain modifications have evolved as a result of the treatment and observation of over 160 patients. Concurrently with this series a group of 50 patients were treated with metrazol. As a further result of our observations a modified technique has been developed combining those factors which in our opinion produced the most favorable results.

EPILEPTIFORM SEIZURE—INSULIN

Previously we had occasion to report (in the *PSYCHIATRIC QUARTERLY* for April, 1938) on "The Epileptic Seizure in the Hypoglycemic Treatment of Schizophrenia." At that time a series of 67 cases receiving the treatment were reviewed with reference to the occurrence of epileptiform seizures. Eighteen such cases or 27 per cent of the group experienced one or more seizures during the treatment. Twelve patients appeared to have been benefited. In at least three instances the occurrence of the seizure seemed to be the deciding factor in the outcome. It was therefore concluded that such seizures during the treatment were not only without danger but in many instances of decided benefit.

Since this original survey our observations have been continued over a consecutive series of 160 patients. Forty-four patients in this group experienced one or more seizures during the treatment. It was observed that the majority of this group showed definite improvement which appeared to be related to the occurrence of the

insulin-induced seizures. Such observations have suggested their apparent value.

EPILEPTIFORM SEIZURE—METRAZOL

The use of metrazol, introduced by von Meduna, presupposes that schizophrenia and epilepsy are biologically incompatible and practically never coexist. Such an assumption has not been borne out by observations at our institution. However, appreciating the apparent value of epileptiform seizures in psychotic states, a series of 50 patients were treated by this method. Results in this series compare favorably with those obtained in the larger group of insulin-treated cases.

It would appear, therefore, that a technique combining the convulsant-producing factors of both forms of therapy and eliminating the unfavorable features would be the most desirable form. A similar conclusion was arrived at by F. Georgi and R. Strauss, reported in the supplement to the *American Journal of Psychiatry* for May, 1938. Here a combination treatment with emphasis on the epileptiform seizure was evolved.

MODIFIED TECHNIQUE

After beginning with an initial dose of from 20 to 30 units of insulin, the dose on subsequent days is increased rapidly so that coma is produced at the fourth or fifth injection. Our objective is to produce coma two hours after the injection of insulin and to maintain the comatose state for two hours. Later, irrespective of the attainment of a comatose dose, the dosage is continually increased so as to bring about convulsions.

Where seizures are induced by insulin or where improvement occurs irrespective of seizures no further changes are made in the treatment. When the maximum state of improvement has been attained the treatment is abruptly terminated without any polarization.

Where no seizures have occurred and where no improvement has resulted after a course of possibly 25 to 30 injections the following addition is made: On the twenty-sixth or thirty-first injection the patient is again given his coma-producing dose of insulin. At the

end of one and one-half hours or just prior to coma the patient is given an intravenous injection of from 2 to 4 cc. of a 10 per cent metrazol solution. As a rule a severe convulsive seizure follows almost immediately. Shortly after the seizure the patient is frequently able to drink his sugar solution. If the patient fails to respond but sinks into coma he is tube-fed within half an hour. On subsequent days the insulin injections remain the same but the dose of metrazol is injected in increasing doses of $\frac{1}{2}$ cc. on alternate days.

We have found that by giving the metrazol intravenously while the patient is semicomatose we can eliminate the marked fear reaction so frequently observed in our original series of 50 patients. In the present group of nine patients who were subjected to the combined therapy after failure to respond to insulin there have been no complications such as dislocated shoulders or jaws. The amount of metrazol necessary to induce a seizure is considerably less. Whereas there has been a failure in improvement of the physical condition of patients receiving the metrazol treatment alone, those receiving the combined treatment invariably gained weight.

SUMMARY

A form of insulin therapy is presented, modified to include the use of metrazol simultaneously with insulin in those patients resistant to the insulin treatment of Sakel. It is well to emphasize here that each first receives insulin therapy but that only unresponsive cases are subjected to the combined treatment.

This modified technique emphasizes the importance of the role of the epileptiform seizure in the treatment of both acute and chronic cases of schizophrenia.

Results in our series of nine cases which showed no improvement following insulin treatment showed that three patients were definitely improved, one sufficiently to warrant parole.

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360 MODIFICATIONS IN THE INSULIN TREATMENT OF SCHIZOPHRENIA

TABLE 1. COMBINED TREATMENT

	Age	Duration of psychosis	Insulin		Combined treatment			Result	Total insulin injection
			Injections before metrazol	Result of insulin treatment	Injec- tion	Grand mal	Petit mal		
L. S.	30	4 yrs. 10 mo.	41	Unimp.	5	3	2	Unimp.	50
R. S.	46	10 yrs. 3 mo.	18	Unimp.	4	3	1	Imp.	23
J. C.	29	1 yr. 6 mo.	25	Unimp.	1	1		Imp.	45
J. B.	24	7 yrs. 6 mo.	11	Unimp.	2	1	1	Unimp.	44
F. K.	31	4 yrs. 2 mo.	43	Unimp.	2	1	1	Unimp.	49
W. S.	24	5 mo.	26	Unimp.	3	3		Imp.	41
S. J.	27	2 yrs. 1 mo.	30	Unimp.	3	1	2	Unimp.	34
G. E.	32	9 mo.	35	Unimp.	10	8	2	Unimp.	44
L. H.	25	9 yrs. 6 mo.	34	Unimp.	9	7	2	Unimp.	52

TABLE 2. INSULIN-INDUCED EPILEPTIFORM SEIZURES

Total patients	Experienced epileptiform seizures	Improved	Paroled
160	44	26	19

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FATALITY FOLLOWING INSULIN THERAPY

A Case Presentation

BY JAMES M. MURPHY, M. D.

Despite the comparative safety of the insulin shock treatment of dementia præcox, cases are reported which have terminated fatally. A knowledge of the causes leading to this fatal issue is desirable. Of those causes that have been reported, the assigned reasons have been of an accidental or intercurrent nature such as pulmonary edema, coronary sclerosis and pneumonia from aspiration or intubation. Pancreatic necrosis also has been found.

Another group of cases has been encountered which does not correspond with previously described fatalities and in which death seems to be more directly ascribable to the deleterious effects of insulin hypoglycemia on the central nervous system. Changes have been sought in the central nervous system and until recently have not been considered remarkable although with increasing knowledge, evidence is accumulating to suggest that not only do transitory changes in the nervous system occur but also that irreversible changes of a permanent character may occur as the result of frequent and severe hypoglycemic reactions.¹

Most writers, while admitting that serious complications may occur, minimize the danger and state that prompt and energetic treatment brings the patient out of coma. The patient described in this paper did not respond to treatment but died on the ninth day following the last insulin shock.

In man, among other findings, the changes in the nervous system have been a slight infiltration of blood cells into the brain substance together with definite cellular changes. No definite hemorrhages were found. These studies were made on hypoglycemic patients other than psychotic ones dying in hypoglycemia from other causes than induced coma for dementia præcox.² Experimental studies on animals are not altogether comparable and have not been convincing.

Extensive zones of degeneration of the nerve cells in the cortex of the brain and in the basal ganglia have been noted. Alterations are found in some endocrine organs, notably the suprarenal capsule

and the pituitary system. The relation of these changes to the insulin hypoglycemia was felt to be equivocal. More recent work suggests that large doses of insulin over a long period of time severely damaged the cerebral neurons. Salm, in a case examined at necropsy, reports hemorrhages in the region of the third ventricle, in the substantia nigra and in the vegetative centers.³

The present report is that of a case in which the patient had dementia præcox of the catatonic type. He died nine days after the last treatment in a course of insulin shock therapy. The patient received 44 injections of insulin between August 24 and November 26, 1937, at the rate of five per week. The initial dose was 40 units and the increment was 40 units. The maximum dose was 320 units which was given on the last 26 days covering 40 calendar days. The total amount was 11,000 units.

There were 35 periods of coma and 205 hours of hypoglycemia. He had two convulsions. No shift in the mental picture was noted following either seizure. Some have found a close correlation between clinical improvement and seizures.

The case was selected for treatment from the regressed and deteriorated group with a view of demonstrating the sedative effect of the treatment if not influencing the psychotic picture. The case was one of prolonged catatonic features with periods of violence and stupor. He had been in seclusion for a considerable time before treatment due to continued assaultiveness. He was hallucinated and expressed many delusions. He was regressed in behavior, filthy in habits and profane in speech. His physical condition was good. It was felt that if treatment were beneficial there were enough points to observe so that a change could be unequivocally noted.

The patient was admitted to the hospital, December 20, 1934. He was 21 years old. For two years previous to this date he had been behaving strangely and having auditory hallucinations, although the acute attack began one month before admission. He went to Illinois in the fall of 1934. There he became confused and thought he was being watched. He was taken to a hospital in that state and later returned to his home. He cried, was irritable and hypochondriacal. He was depressed, threatened homicide and suicide, was hallucinated and expressed delusions.

On examination at this hospital he was slow in actions, uninterested, complained of stomach pains, was bewildered and careless of his appearance. He thought his mother was at the hospital and any woman he saw he thought was his mother. A few days later he became assaultive and struck a nurse. He crawled on his hands and knees and often was found on his knees in prayer. He answered questions very shortly in a hollow voice. He had to be dressed and urged to eat. He wet and soiled himself.

Three months later his condition was unchanged except for occasional loud cursing and exclamations as "Oh God," "I ain't here" and "I'm dead." This forthright expression of the death wish may have no psychological significance but that it was uttered seems noteworthy. He spoke of himself in the third person and said he had been dead for a long time.

A year later he was more active but had shown no improvement. He was in seclusion much of the time, screaming because of frightful hallucinations. His productions were incoherent. He was destructive of clothing, untidy and smeared feces about the room. His physical condition was good but his weight was below average although he was strong and wiry. The only attention he paid anyone was to spit at him when he approached. In this condition he was started on the insulin treatment, August 27, 1937.

During most of his treatment he was in restraint due to his restless activity and assaultiveness. He spat continuously. When he finished eating he would throw the dishes through the opening in the door into the hall. He was destructive and untidy. He would suddenly kick at anyone he could reach. He screamed and screeched much of the time. When not being treated in restraint, he spent his time in seclusion. In his room he would pace in a circle for hours. His attention could not be gained and no coherent productions were heard. He was continuously hallucinated. He gained in weight and his strength was such that in struggling, it required several men to restrain him. He smeared feces about the room and threw it into the hall. The only sensible remarks were requests for more food when he was spoonfed at the end of treatment.

There was little change if any until September 22. Then he was quiet, neat and orderly and was allowed about the ward. He

sat and read newspapers, something he had not done for months. He talked with attendants, particularly one recently employed who took a special interest and tried to help the patient. This improved behavior was noted after the twenty-second injection when the amount of insulin had reached 320 units, and he had four treatments with this amount.

The following week he lapsed back into his dilapidated state although he could be appealed to and would become courteous, attentive and cooperative for a few hours at a time. He still had auditory and visual hallucinations. He did not soil himself or smear feces about. He did not spit.

After 31 treatments he had his first convulsive seizure. It was the thirteenth successive treatment in which he received 320 units. Conversation with him at this time was coherent enough to ascertain such wants as food, going to the toilet and desire for reading matter. He did not pace about his room in a circle as before. His spontaneous productions were incoherent and concerned with being stepped on by a cow, shooting someone, being in another world and causing people trouble.

There seemed to be a more composed facial expression and he did not have the wild hunted expression that had been habitual, particularly in his eyes. He ate fairly well and slept well and his physical condition was good. His hallucinations and delusions were much in evidence. Except for the few days of orderly behavior on September 22 and 23, he showed no considerable improvement and after those days returned to a state much the same as he had shown before treatment. On October 16 he was so noisy that he was given morphine and hyoscine to quiet him. He was confined to a room.

The next week he received three treatments, due to regular rest days and extra omissions for a convulsive seizure and a day on which there was a rise in temperature. Each treatment was of 320 units. His behavior was unchanged; he spat, soiled and was spoonfed so that he would not throw utensils around after using them. He cursed and struck at anyone near him. He made a practice of spelling out many of the words he used in conversation. The spelling was always accurate. He noticed and made comments on

his surroundings. He spoke of death and the end of the world and said today was his last day on earth. This was on October 21.

He had a convulsion on this day and did not receive treatment for three days. On October 25 and 26 he received 320 units. He did not react well on these days and treatment was terminated by gavage earlier than the usual duration of coma because of shallow respirations. On awakening on the twenty-sixth he was violent, threw himself around, tried to strike at attendants although in a restraint sheet and he spat continually. He refused to eat. He was returned to a guard room by being placed in a restraint sheet and carried. Due to the difficulty of getting him up two flights of stairs because of his struggling, he was taken up on the elevator. He screamed and coughed until he vomited the sugar solution and in the afternoon he went into coma again. He was gavaged and in addition was given 100 c.c. of 50 per cent glucose by vein. He awakened promptly and was again violent. He was given morphine and hyoscine at 3 p. m. and became quieter. In the evening he was awake and walked to the bathroom. He talked to the attendant and was given a comic sheet to look at. Nothing unusual was noted at midnight at the change of tours.

In the morning he was not given treatment because of his somnolence and it appeared he was sleeping so soundly that he could not be readily aroused to be brought to the treatment ward. This was the onset of what proved to be the terminal coma although no such thought was entertained at the time. The attendant was rebuked for not distinguishing coma from sleep. The patient's pulse was strong and regular. His respirations were normal and 20 to the minute; the pupils were widely dilated as usual and reacted briskly to light. He swallowed saliva as it collected in his throat. He was tubefed with egg nog and given tincture of belladonna to overcome the vomiting. He stirred slightly when the nasal tube was passed.

On the next day he was unconscious but seemed improved. At this time it was thought his condition was due to exhaustion from constant violent struggling, loss of sleep and the chemical sedation. The temperature was normal, respirations were 14 to 20 per minute and pulse 80 to 100 per minute. He was tubefed twice on this day. The eyes rolled upward and the pupils were less widely dilated. He was given 50 cubic centimeters of 50 per cent dextrose.

On the twenty-ninth the degree of consciousness was unchanged. He was very quiet and the only movement was rolling the head and legs from side to side. He swallowed saliva and rolled his eyes. Nothing in the way of abnormal reflexes was found, no evidence of meningeal irritation, chest was clear, and cardiovascular system was normal. His rectal temperature was 100. He voided and was given enemas.

Two days later he seemed to be regaining consciousness but had not awakened or spoken. He wrinkled his brows, held his lids shut when the attempt was made to open the eyes, tensed his arms and hands when attempts at flexion were made and turned away from the nasal tube when it was inserted. His temperature was 101.6. His color was good. The pulse was 100 per minute, strong and regular. A roentgenogram of the chest showed the lung fields perfectly clear.

The cause of the patient's condition was still a puzzle but he appeared to be gradually improving and no alarm was felt.

On November 1, the sixth day of the coma, he suddenly became worse and was removed to the sick ward. He became cyanotic, pulse was irregular at 132 per minute and respirations were 32 per minute. Fluids and food were supplied by gavage. He resisted passive movement of the arms and held his eyes shut forcibly. His temperature was 102.2°. He was given digitalis. Blood sugar was 136 and nonprotein nitrogen was 60.

The next day there were periods when he appeared moribund. The temperature reached 104°. Respirations were short and shallow. He responded to stimuli such as blowing on the eyelids, touching the lips and pressure on the supraorbital nerve and by persistently turning his head to the left side away from those in the room. Urinalysis was normal. Spinal tap showing slightly increased pressure, clear fluid, no cells or increase of globulin and sugar was 122. The tap did not change the clinical picture. The blood pressure was 130/85. The heart was very irregular in rhythm and the rate rose to 162 per minute at times. He was nourished by gavage.

On November 3, the temperature reached 105.8°. He remained stuporous. The nonprotein nitrogen was 90, the blood count was 15,000, 78 per cent polymorphonuclears, 12 per cent large lympho-

cytes, 8 per cent small lymphocytes and 2 per cent basophils. Blood culture was negative. He was given fluids by hypodermoclysis and by gavage. The pulse was regular and strong and 132 per minute. No abnormal reflexes were present. Respirations were rapid and deep and at times there was cessation of breathing, which seemed voluntary. The cheeks and lips were bright red. There had previously been some pallor which was changed to a quick brief remarkable flushing of the face, arms and body when he was given intravenous glucose and again when given calcium chloride by vein. The flushing was intense and of very short duration and was taken as indicating some marked vasomotor lability.

During the night his temperature gradually rose to 108° and he expired on the morning of November 4 without regaining consciousness. His color had remained good. The length of coma was nine days.

Necropsy was performed four hours after death and did not reveal any definite abnormality to gross examination. The brain and medulla were removed and sent to the New York State Psychiatric Institute, together with other tissues.

COMMENT

A case is presented in which the patient died nine days following the last injection during the course of insulin shock treatment for dementia præcox. He had completely regained consciousness from the morning coma, but later lapsed into unconsciousness and did not regain consciousness again for the duration of the illness.

The course ran from apparent benign coma, stupor or conscious death wish to fatal termination.

That he might have died from causes other than the insulin shock and central nervous system damage is possible. If such be the case, he would seem to be one of the many deaths with catatonic dementia præcox in the excited phase, not presenting clinical or gross postmortem evidence of the cause of death.

There was no cranial injury.

None of the measures which were symptomatically and empirically administered changed the course of the coma.

Tuberculosis was not noted in this patient. This is mentioned because of the frequency of tuberculosis as the cause of death in dementia præcox.

The blood sugar was within normal limits.

Intravenous dextrose and spinal tap were used to relieve cerebral edema, if present.

Spinal tap did not change the clinical picture. There were no abnormal findings in the spinal fluid.

Morphine-hyoscine was given as a sedative, but does not seem to have been an adequate complicating factor.

Except for a two-day period, the patient was not benefited by the treatment, and was unimproved when last treated.

Realizing that the patient might recover if not overtreated, only judicious treatment was given. In view of the normal blood sugar, large amounts of dextrose were not exhibited intravenously.

Although fatal cases from possible central nervous system damage due to insulin therapy have been infrequently reported, as yet, they may be expected if rigorous treatment is applied. It appears that irreversible changes may occur, treatment is symptomatic and recovery is fortuitous.

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BOOK REVIEWS

The Occupational Treatment of Mental Illness. By JOHN IVISON RUSSELL, B. B., Ch. B., F. R. F. P. S. (Glas.), D. P. M., medical superintendent, North Riding Mental Hospital; visitor, mental deficiency institutions, M. R., Yorkshire; examiner in occupation therapy to the Royal Medico-Psychological Association; examiner to the Association of Occupational Therapists. With foreword by William Rees-Thomas, M. D., B. S., F. R. C. P. (Lond.), Dipl. Psych. Med. (Camb.), senior medical commissioner, Board of Control. Illustrations by Joseph Blagdon Morgan. Price \$2.50. William Wood and Company, Baltimore.

The author states in his preface that he wrote this book "with the needs of the mental hospital nurse primarily in view, but that it is hoped that it may prove helpful to the occupation therapist and to others who are concerned with the welfare of patients in mental hospitals." This aim is adhered to throughout the book. It is an account and description of the organization and development of occupational therapy in the North Riding Mental Hospital in York, England. The work there is organized into classes in occupation centers, ward classes, outdoor classes, and physical training and recreation. The outdoor classes consist of the patients who care for the lawns, gardens, etc., and some classes in the occupation centers include work that is classed as hospital industries in this country.

The book is in two parts. The first part opens with two chapters on psychological and clinical types. The author then takes up the practical details of organizing an occupational therapy department, beginning with the prescription by the physician. This book should be particularly helpful in organizing occupational therapy in a hospital where it has not been in use previously, for he describes how the patients were first classified according to type and occupation, with statistics for each class, and then shows how many patients from each class were distributed throughout the various occupational therapy classes and the results of treatment in each group. In the author's hospital, occupational therapy is not considered as a department, separate from other hospital activities, but as a form of therapy in use throughout the entire hospital. He advocates its being administered by nurses who have had some training in the theory and simple practices of occupational therapy, and who are directed and supervised by specially trained occupational therapists. Also of value to a hospital opening a new

occupational therapy department are the chapters on accommodation and equipment and on the care and purchase of supplies.

Part II is almost a working manual on a number of crafts: woodwork, basketry, brush making, occupations in coir, bookbinding, plaster modeling and casting, concrete and cast stone work, and miscellaneous minor crafts. This is followed by a directory of supplies. When one remembers that it is written primarily for nurses, rather than for therapists trained in craft work, one sees why he gives such specific directions for the various projects.

The author has given us here a clear, comprehensive account of what he and his staff have done in one hospital and while conditions and customs differ in many ways from those in this country, it is a book that any one concerned with the care and treatment of mental patients might read with interest and advantage.

Personality Structure in Schizophrenia. A Rorschach investigation in 81 patients and 64 controls. By SAMUEL J. BECK, Ph.D. Nervous and Mental Disease Monog. No. 63. New York, 1938. ix+88 pages. Price \$2.00.

This book is essentially an elaboration of the chapter on schizophrenics in Dr. Beck's Introduction to the Rorschach Method. Chapter I offers a brief description of the Rorschach method and lists the various investigations conducted by means of this method. Chapter II describes the author's own investigation of schizophrenics: he obtained records from 81 schizophrenics and from 64 controls, the control group being composed of 33 normal individuals and of 31 neurotic patients. Chapter III contains a good example of a typically schizophrenic Rorschach record and the record of a normal person of the same sex, age and education.

Chapter IV presents the statistical findings. Among the Rorschach components which permit of quantitative treatment Beck found seven in which the schizophrenic group differs significantly from the control group. They are Dr, DW, C, CF, FC, F+, and P. In Chapters V and VII we find Beck's psychological evaluation of the statistical findings. Chapter VI contains the interpretation of the schizophrenic Rorschach record of Chapter III. Chapter VIII describes a few characteristic schizophrenic inkblot interpretations.

The contribution of this book lies mainly in its statistics, which are compatible with some of the statistical data compiled by Rorschach and others. It seems, however, that the value of Beck's statistical findings would have been enhanced if the author had taken a definite stand as to the justifiability of Rorschach's claim that several components of his method are specific in schizophrenia. These components are (1) the great variability

in the degree of precision with which the interpretations fit the respective inkblots, (2) contamination, or the unintelligible condensation of two different interpretations into one response, and (3) interpretations determined merely by number or position regardless of the shape of the interpreted inkblot.

The Rorschach method has its own symbolic language. It is very difficult to master this language and it is not easy to translate the Rorschach findings into commonly used psychological terms. Beck attempted this difficult task and it is doubtful whether one could agree with him on all points. E. g., to interpret the C (or color response) as "emotional energy," "drive," "force," or "zestful experiences" does not seem to be quite accurate for in many patients we find a great emotional sensitivity without strong drive and without any zest for emotional experiences. Then, too, the M (or human movement response) cannot always be considered an indicator of creative phantasy or of creativity; it would seem more prudent to define it as productivity omitting any implications as to whether or not the latter is desirable. It is open to question whether all schizophrenics have the same type of color and movement responses as normals. Thus, direct comparisons based on quantitative differences may be misleading.

One of the problems of the book was to "tell us in what ways the Rorschach test . . . is valid in singling out members of this (schizophrenic) clinical group." This problem has not been solved clearly. In fact, most of the seven statistical differences which Beck enumerates as differentiating the schizophrenics from the controls are not specifically schizophrenic but are found in many other psychiatric groups. Apparently, Beck preferred not to repeat the rules which he laid down in the chapter on schizophrenics of his "Introduction"; this chapter is more helpful in recognizing schizophrenia in individual cases than is the present volume.

Thalassa, a Theory of Genitality. By SANDOR FERENCZI, M. D. Translated by Henry Alden Bunker, M. D. The Psychoanalytic Quarterly, Albany, N. Y. 1938. 110 pages. Price \$1.75.

The last chapter of Dr. Bunker's English translation of Ferenczi's *Ver such einer genital Theorie* appeared in the Psychoanalytic Quarterly during 1936. As a contribution not only to psychoanalytic literature, but to scientific knowledge, the essay is worthy of the permanence of its book form. The author called his work a "theory" and at no time has he pretended that it is otherwise. Naturally he has attempted to prove his assertions. Since the extent to which a theory becomes accepted is determined by the plausibility of the supporting facts, Ferenczi has built his superstructure

on the foundations of biology. Haeckel is freely quoted and although Lamarek enjoys greater favor than Darwin, the latter too has contributed. The source material is justified by the statement that "an importation into psychology of concepts belonging to the field of natural science, and into the natural sciences of psychological concepts, was inevitable and might be extremely fruitful . . . As soon . . . as one desires, in addition to description, to make some assertion regarding the meaning of a process, one involuntarily grasps for analogies in alien scientific fields." These analogies "should be drawn from fields as remote as possible." "All physical and physiological phenomena require a *meta* physical (i. e., psychological) explanation and all psychological phenomena a meta-psychological (i. e., physical) one." Since only a dynamic psychology can be applied to the dynamic biology of evolution, the psychological concepts employed are of necessity psychoanalytical.

The book is divided into three sections: the first two present and explain the ontogenetic and phylogenetic observations and parallels while the last part is the "epicrisis." Ontogenetically, genital erotism and "the erotic sense of reality" are explained as evolving from the union (displacement and condensation) of anal and urethral erotisms. This union is called *amphimixis*. (Several critics and reviewers have noted that "*amphimixis*" was a rather poor choice since Darwin and others used the word in another sense, but it is well to note that Ferenczi's special use does not cause confusion). The biological development of the embryo and of the child are compared with psychoanalytic case histories and psychoanalytic symbolism to support this thesis. From the proof of genital erotism as an *amphimictic* phenomenon, it is but one step to the consideration of coitus as an *amphimictic* phenomenon. Particularly interesting is the interpretation of the individual phenomena in the sex act. Ferenczi's theory considers coitus the culmination of attempts of individuals of both sexes to regain the maternal womb. The interpretation of the individual phenomena is designed to support the theory.

The second section presents the phylogenetic parallel of ontogenetic sexuality. Genital sexuality first appeared with the drying up of the seas. The individual's regression to the maternal womb has a phylogenetic parallel in a regression to a previous mode of living, i. e., a regression to an aquatic existence. (From this the book derives its name: *Thalassa* is the Greek for "Sea.") "The first and foremost danger encountered by organisms which were all originally water-inhabiting was . . . that of . . . desiccation." Coitus began perhaps as a struggle for moisture. "In the earliest attempts at coitus on the part of fishes, after the recession of the oceans, it was a matter of attempting to regain in an animal body the moist

and nourishment-providing habitation of the sea, now lost." Ferenczi explained the fusion in a single act of the functions of coitus and fertilization as a "regression to the same mode of adjustment (union with another organism) as had proved advantageous in the case of an earlier catastrophe." The development of individual genitality is thus based on ontogenic catastrophes which reproduce the geological catastrophes of phylogeny. The second catastrophe produced individual unicellular organisms. Its ontogenetic parallel is found in the maturation of the sex cells. The second catastrophe produced individual unicellular organisms. Its ontogenetic parallel consists of the liberation of the mature germ cells from the gonads. The third catastrophe brought about the beginning of sexual propagation and the development of marine life. The ontogenetic parallel is fertilization and the development of the embryo in utero. The fourth catastrophe is the recession of the ocean. The consequent adaptation to terrestrial existence can be compared to ontogenetic birth, and the development of animal species with organs of copulation is reproduced ontogenetically in the development of the primacy of the genital zone. A fifth catastrophe, the coming of the ice ages, serves to continue the comparison.

The epierisis is not only a criticism and judgment but an exposition of some of the by-products in the development of the theory. The regressive similarity between coitus and sleep is studied in detail. The conclusions to be drawn from the application of psychological and psychoanalytical concepts to biology ("bioanalysis") are enumerated, and some practical applications of the theory are attempted in the last chapter.

Although this essay presumes some knowledge of psychoanalysis and of biological theories, it is felt that it should be read by all with even a remote interest in these two fields. Ferenczi has quoted Goethe in saying that a "bad theory is better than none at all" and Haeckel has said: "We must assume to be true, and accordingly retain, every theory in harmony with the actual facts, insufficiently founded though it may be, until it is replaced by a better one." Regardless of whether or not *A Theory of Genitality* absolutely satisfies these criteria, the book is, if nothing else, interesting and well worth reading.

The Patient and the Weather. By WILLIAM F. PETERSEN, M. D., with the assistance of MARGARET E. MILLIKEN, S. M., Vol. IV, Part 2. 729 pages. 1937. Part 3. 651 pages. 1938. Edwards Brothers, Inc., Ann Arbor, Mich. Price, each part \$10.00.

Parts II and III of the fourth volume of Dr. Peterson's extensive work serve to further elaborate his postulate of the important role meteorological variations play in the causation and course of illness. They continue the

survey of disease entities begun in Part I of this volume which was reviewed in this journal, January, 1938.

The second section concerns itself with thyroidism, diabetes, blood dyscrasias, and tuberculosis. The third sets forth the view that in general, surgical diseases are primarily due to changes in autonomic tonus and not to infection.

The variability of the meteorological environment and the corresponding variability of the metabolic responses are stressed throughout. The author designates the status of relative closure of portions of the vascular bed, the A. R. S. phase (relative anoxemia, anabolism, reduction and spasm). For the period of decreasing blood pressure the term C. O. D. (accentuation of catabolism, oxidation, vascular dilatation and acidity) is used.

Although man controls his environment to a great degree he is particularly at the mercy of the trophosphere and can be considered as a "cosmic resonator" despite his higher faculties. Instead of disease = human + bacteria, Petersen feels that it is fundamentally a phenomenon of inadequacy to environment, involving the factors of biological rhythms, constitution, autonomic apparatus, hereditary background and social milieu. Vascularization and consequent adequacy of oxygen supply determines the actual precipitation of the clinical picture.

"To put it simply: In our region of the world, the febrile fluctuation, the leucocyte count, the Wassermann and Kahn reactions, bacterial dissemination or localization, thrombosis or embolism, the clinical episode that brings the situation to the attention of the patient and the patient to the physician, are meteorologically conditioned."

Functional demand may result in hypertrophy or atrophy, undue irritation, or undue fatigue or exhaustion. Further, the leptosome meets the environmental situation, especially the meteorological, by prompt and forceful chemical and endocrine swings. He is readily exhausted, not infrequently overcorrects, and presents autonomic disintegration. He suffers chiefly with schizophrenia, tuberculosis, severe diabetes, thyroidism, migraine, hyperpiesis and so forth. The pyknic resists environmental influences by insulation, buffering, lessened oxidation and by prolonging the biological swing. He suffers with "wear and tear" diseases such as arteriosclerosis and late diabetes.

Certain concepts of the presentation stand out: The clinical picture of hyperplasia and hyperthyroidism and Graves' disease may be considered as one of anoxia with the peripheral symptomatology (tremor, weakness, vascular dilatation, and so forth) initiated by periods of undue sympathicotonia, and thyroid hypersecretion likewise initiated by relative anoxia in the gland itself—a vicious circle. By actual clinical test the reactive be-

havior of the cretin to the meteorological environment increases under thyroid medication. ". . . it might be warranted by analogy to assume that a lessened thyroid activity is inherent in the constitutional makeup of the pyknic individual." A series of cases presenting thyroid crises are charted against appropriate meteorographs to show that these are more apt to follow severe meteorological demands. Among other corroboratory points the seasonal variation in the gland itself with respect to histology and iodine content, the frequency of thyroid deaths with respect to polar episodes, and the geographical distribution of the disease are cited.

A series of records pertaining to blood dyscrasias related to meteorological variations follows a discussion of the lability of the haemopoietic system. In this instance again the writer maintains that in certain individuals the last event in a chain of events producing, for instance, granulopenia may be a chance infection, trauma, dietary indiscretion, the sex rhythm or the weather fluctuation. From the literature cited and case records studied Petersen concludes that the individual who develops granulopenia is usually an unstable leptosome and a female, that there is a seasonal and regional distribution and that drugs, infection or trauma may serve to sensitize the individual. With respect to the dyscrasias the writer shows that "the clinical picture and cytological picture merely reflect environmental alterations."

Dr. Petersen treats the tuberculous patient similarly—"where symbiosis of host and parasite is obvious and we shall merely follow the meteorological disturbance of this equilibrium as it is reflected in the blood chemistry, in the blood morphology, or finally in the clinical end result . . ." By reference to case records correlated with meteorographs the author shows that the seasonal and sex cycle are dominant in activation of the tuberculous process. Degree of activation was charted in curves illustrating sputum volume, temperature, leucocyte count, urine potassium and so forth.

To the psychiatrist the incidental remark that "insanity" is, in the author's opinion, an expression of regressive evolution, has an echo in the usual concept of psychosexual regression.

On the frontispiece of Part III which deals with surgical problems the following from Hippocrates is inscribed:

"One should be especially on one's guard against the most violent changes of the seasons, and unless compelled, one should neither purge nor apply cautery or knife to the bowels until at least ten days have passed."

The case material in this section pertains to appendicitis, gallbladder disease, gastric ulcer, acute pancreatitis and similar disorders. Again it is correlated with meteorographs. Several observations of the writer's are developed: the biological phase with reference to resistance; the role of smooth

muscle spasm (vascular and visceral) and the associated anoxia of related membranes for necrosis and bacterial penetration; "the importance of the rhythm of organic stimulation and overstimulation and fatigue as it concerns resistance, and the relation of this to season, to the individual meteorological episode, to the menstrual cycle, et cetera."

The author's remarks with respect to the "common cold" following a pressor episode is another practical hint to the surgeon along with the figures on the seasonal variation in operative mortality. His well-documented contention that "inflammation occurs when the oxygen (and energy) supply of a cell group that has been stimulated to a degree beyond the range that we regard as physiological, becomes inadequate," is also worthy of note. The fact that an analysis of the relative pH of the population at large over a series of years should reflect in some measure the degree of atmospheric turbulence is a startling fact. However the author correlates these curves with those for sun spot activity. The facts that ulcer is practically nonexistent in tropical man, that ulcer episodes are precipitated in showers throughout the population, along with other acute abdominal conditions, and that appendicitis mortality is greatest in spring and autumn bear quotation.

Following a review of postoperative complications with reference to environmental alterations Petersen states that American surgeons would lessen mortality rates by taking their vacations in the late winter and spring and that it will not be long before all postoperative patients will be placed under wholly controllable atmospheric conditions. A section on orthopedic cases is included because periosteum and joints are likely to register the effects of relative sympathicotonia. Ophthalmology likewise offers an exquisitely sensitive field for observation of these reactions, and in this connection a case is quoted in which alkalization for relief of gastric ulcer produced more headache and greater intraocular tension.

These concluding sections of volume four of Petersen's work are likewise commended to the physician. He should not be repelled by their formidable size—much of them is interesting case material.

To the neuropsychiatrist, however, the importance of emotional factors in the labile individual cannot be overstressed in chronicling clinical events. On the other hand Petersen's viewpoint should be salutary to that of the neuropsychiatrist—he is as narrow as any "specialist." Further these volumes advance meteorological variability as but one etiological factor in a chain of circumstances. However it is an important one of which sight has been lost too long.

The bibliography is extensive.

Perhaps the author's chief aim is expressed in the following:

"Nevertheless, I insist that we, as clinicians or as pathologists, should view disease and death from the wider standpoint of the anthropologist; as anthropologists, regard life from the point of view of the biologist; as biologists, from the point of view of the physicist and the chemist; and as chemists and physicists, fit life into the structure of the astrophysicist and mathematician."

The 1938 Yearbook of Neurology, Psychiatry and Endocrinology.

By H. H. REESE, M. D., H. A. PASKIND, M. D., and E. L. SEVRINGHAUS, M. D. Chicago. The Yearbook Publishers, 304 S. Dearborn Street. 1939. 776 pages. Price \$3.00.

This concise manual of progress during the year has come to be a medical classic and its appearance each spring is looked for and welcomed. Its scope is about evenly divided among the three subjects.

It is cheering to observe the drift towards "the organism as a whole" concept as opposed to narrower conceptions formerly universal and still too prevalent. The editors have adhered to the neutral attitude and have patiently recorded all that appeared prominently in medical literature during the year, even to more studies of cerebral pathology in dementia præcox and manic-depressive psychosis although the results are no more convincing than formerly. In this 1938 edition the high standard of previous years has been maintained.

Other volumes of the series are available covering the entire field of medicine, surgery and specialties.

Interne's Handbook. A guide especially in emergencies for the interne and the physician in general practice. M. S. DOOLEY, A. B., M. D. 2nd edition, revised and reset. J. B. Lippincott Company, Philadelphia, 1938. 523 pages. Price \$3.00.

This useful and practical handbook is a veritable vade mecum of hints, suggestions, admonitions, formulae and directions calculated to guide the beginner in doing his work when no longer under the eye of the instructor. It was prepared by a committee of the faculty of the College of Medicine of Syracuse University, of which Dr. Dooley is the chairman.

Its scope is the whole field of medical science. Its usefulness is not limited to the interne; do you wish to refresh your memory about blood groupings; the diseases associated with dyspnea; the causes of acidosis and proper treatment; when not to employ colonic irrigation; the proper vehicle for administration of almost every common drug? All this and much beside will be found in its 523 pages and surprisingly—the book is a small one.

Guiding Human Misfits. A practical application of individual psychology. By ALEXANDRA ADLER, M. D. The Macmillan Company, New York, 1938. 88 pages. Price \$1.75.

In this small but valuable book Dr. Alexandra Adler follows the principles of individual psychology as laid down by the founder of this psychological approach, Alfred Adler, the author's father. We find in *Guiding Human Misfits* another precipitate of her experience as child guidance psychiatrist and psychotherapist.

Some of the conflicts and motives, as well as the goals and cravings underlying behavior problems, childhood neuroses and delinquencies are discussed theoretically and therapeutically. An early discovery of problems should enable the child guidance worker to solve them by adequate educational means. The child guidance approach to the potential neurotic and the potential criminal are well illustrated by examples from the author's clinical experience. We find in this book very useful hints for tactful therapy and technique. The instillation of courage, the creation of confidence, the importance of the social feeling in early life are all given proper consideration.

The last chapter of the volume especially summarizes practical aspects of child guidance and emphasizes the therapist's efforts in securing parental cooperation. The author has added Alfred Adler's questionnaire for the understanding and treatment of problem children.

The book as a whole is well written, is interesting and can be recommended to physicians, students, social workers, educators and parents. Still, we must not overlook that there are other possibilities of approach to "human misfits," that not all problems in children can be solved as readily as it may appear in the light of individual psychology.

Marihuana—America's New Drug Problem. A sociological question with its basic explanation dependent on biologic and medical principles. By ROBERT P. WALTON, with a foreword by E. M. K. Geiling. J. B. Lippincott Company, Philadelphia, 1938. 223 pages, including bibliography and index. Illustrated. Price \$3.00.

There having been so much written in feature articles for popular magazines and in newspapers about the "reefer" menace, the present book supplies a definite need. It is readable, well organized in its presentation, and sheds light on the several sides of this narcotic evil. The author is professor of pharmacology of the School of Medicine, University of Mississippi; the writer of the foreword holds a similar position at the University of Chicago. The chapter on the present status of the vice in the United States

was prepared by Frank R. Gomila, M. D., commissioner of public safety of New Orleans and Madeline C. Gomila, M. S., assistant city chemist of that municipality.

Concerning the nature of the study, Walton tells us in his preface: "The subject is essentially a sociological problem with its basic explanation dependent on biologic and medical principles. It is hardly anticipated that many individuals will be interested in all aspects of this subject and the book is primarily a reference source for those seeking information on the particular features of this drug practice."

A complete reading shows the book to resolve itself into three parts. The first five chapters lay the foundations: history and distribution of the hashish vice; present status of the vice in this country; botanical descriptions of the plant source; lastly, techniques of ingestion or administration.

The second hypothetical part will be of the greatest interest to psychiatrists and psychologists. Here the effects, subjective and objective are described. The "hashish experience" is recounted in chapter six from four vantage points: literary, scientific—subjective, scientific—objective, and psychiatric; the next two chapters are labeled: Acute Effects, and Chronic Effects. Why these two latter chapters were not included under the scientific descriptions is not entirely understood, unless they were to be in the nature of a résumé. The brief section on psychiatric descriptions of the hashish experience is somewhat disappointing; perhaps it could not be otherwise, in view of the paucity of such material in print. Bromberg's work in 1934 is related, but Drewry's study (misspelled Dreury) in 1936 is given scant comment, in only two lines. Further, the citation of "sexual stimulation" as a feature of the patient's reaction is a misinterpretation of Drewry's exact words. Something appears to have gone wrong with the reference numbers in the text at this point since the anticipated number 208 does not appear over Drewry's name.

The psychiatrist, however, will find much of what he is looking for under "literary descriptions" and under the chapters on acute and chronic effects.

Therapeutic applications, in chapter nine, cover only seven pages since, as Walton says, "The therapeutic application of Cannabis is more a matter of history than of present-day practice." The author maintains that the therapeutic use of Cannabis and the hashish habit are almost entirely unrelated: "The marihuana habit came into this country by other channels." Pharmaceutical and chemical considerations bring the study to a close; here, in chapter ten, one finds an illuminating section on determination of physiologic activity, included in which are some results obtained through experimentation with animals.

Praise is due Walton for his effort. He has viewed this drug problem through the correct end of the telescope, and in view of his very special training in the field of pharmacology, it can be said that he has achieved an admirable breadth of approach. This book can be read with advantage by every literate citizen; the scientist, the physician, the academician, the "man in the street"—all can profit by an acquaintance with the facts presented in this work. It is heartily recommended.

The Road Upward. Three hundred years of public welfare in New York State. By DAVID M. SCHNEIDER and ALBERT DEUTSCH. New York State Department of Social Welfare, Albany, 1939. 57 pages. Paperbound. Public Document.

Commissioner Adie has done well to plan a series of pamphlets dealing with the development and growth of social welfare in New York State beginning with the colonial period. The present pamphlet deals with the general subject of welfare including old age relief and unemployment relief. After reviewing the whole subject of public assistance when it was dispensed only by townships, as was the case in colonial days, through the period when the dependent poor were auctioned off to the lowest bidder to be cared for without much, if any, supervision, the account goes on to a good description of the present setup. One chapter records the origin of the earlier institutions for mental cases, several of them having first been county institutions.

Other pamphlets of this series already planned will be: *Provide, Prevent, Restore*, explaining the State program for public assistance; *Women and Children First*, a story of the State's service for children; *At Eventide*, discussing the work of assisting the aged; and *Eyes to the Blind*, telling of the work for prevention of blindness and of aid to the blind. The series will be found useful to teachers and social service groups, and should be in all public libraries.

Eat and Keep Fit. Scientific secrets of diet. By JACOB BUCKSTEIN, M. D. Emerson Books, New York, 1938. 96 pages, charts and index. Clothbound. Price \$1.00.

This is pretty light stuff and would scarcely find a prominent place on the bookshelf of the psychiatrist. Chapter X, "How the Emotions Influence Digestion," is its closest approach to the psychodynamics of diet, and even here the treatment is superficial. Fear, anger, "nervousness," pleasure, fatigue, such are the headings under this chapter, and the comment is brief, in fact it is well nigh microscopic. There is no argument with the authenticity of the material, but the phrase "scientific secrets of diet" does

seem unnecessarily alluring. It is, withal, a handy little volume, neither superior nor inferior to many others of its kind.

The Scientist in Action. A scientific study of his methods. B WILLIAM H. GEORGE, M. Sc., Ph.D. Emerson Books, Inc., New York, 1938. 354 pages, with bibliography and index. Price \$3.00.

It will be difficult for the general reader to resist the suggestion contained in the blurb surrounding the dust cover of this work. On a bright orange band it is claimed that H. G. Wells went without his dinner to pursue the reading of this book. Perhaps the reviewer should have felt a bit sheepish when he laid down *The Scientist in Action* after reading chapter one, and found himself still capable of eating a full dinner in relative disregard of what might be ahead in chapter two.

However, the work is the choice of both American and British scientific book clubs, a recognition of merit not to be scoffed at easily, and the reviewer would be the last to deny that the writer has something important to say. There will be times, dear reader, when you will feel that Dr. George has achieved a new "slant" on the problems of scientific research; but there will also be times when you will feel that you have long been acquainted with the material, and that its new phraseology is mere a *raison d'être* for another book.

The author, a physicist, declines to use the word "gestalt" in Chapter VII, "Are Facts First Seen in Isolation?" but there is a discussion of gestalts as plain as the nose on your face. The treatment of "incompleted patterns" on and about page 206 is a restatement of what the psychiatrist already understands about the tendency to overscrupulousness. This gives one pause and makes him wonder if the scientific researcher might not be as much a prey to this insidious tendency as is the neurotic. In his arrangement of data, the research worker may easily make the mistake of wedging observed experimental data into preconceived patterns, the while he overlooks new, revelational patterns of these data. This is worth bearing in mind before embarking upon any research program.

It is a rare book these days that does not have a "message" which urges us out upon some broad crusade. The following selection from the preface will give you an idea of the author's hope for the future:

Scientific action is in itself a fascinating subject of study. But I see it also as an untried agent of tremendous power in dealing with social problems. The *results* of scientific research are being applied in practical affairs so as profoundly to alter civilization and to affect human happiness. Whilst this application of results

is solving some social problems, it is creating or intensifying others. Traditional methods of dealing with them are failing. Scientific *action* is the only untried method at present known. To those interested in social problems, I would therefore offer this book as a study of the means of helping mankind to enjoy more of the blessings of science with less of its curses.

Dr. George has much to say later in the book about the teaching of science and research facilities and opportunity, in chapter sixteen, "The Future of Experimental Research." Of the former, he insists that the schools and universities (of Great Britain, at least) teach science, but not scientific method:

(p. 205) . . . it is well recognized that in some schools Science Masters have been appointed more because of their powers to project spheres with suitable velocities at suitable times than for their abilities to teach Science to boys . . .

The comments on research facilities are pointed and worth consideration; they cover, among other elements, the problem of specialization, the cost of research, research and charity, and facilities and freedom needed for free-lance research.

Owing to much restatement and retracing of the steps in his thesis, the writer does not carry his reader along in a smooth-flowing stream of thought. One has the impression that greater economy of expression and presentation could have been attained; nevertheless, the reviewer is willing to state that this is one of the most unusual and provoking books that has appeared in recent months. It will stimulate the student heading for scientific fields; it will provide fascinating reading for the established research worker; it will paint enticing silhouettes on the horizon for the sociologist in search of scientific method.

A Visual Motor Gestalt Test and Its Clinical Use. By LAURETTA BENDER, M. D., Ph.D. Research Monographs No. 3. American Orthopsychiatric Association, New York. 165 pages.

In this small volume the author has taken gestalt psychology a considerable step forward. That school has already added much to dynamic psychology but Dr. Bender presents a further scientific exploration and clinical use of the material.

She first defines the gestalt function as "that function of the integrated organism whereby it responds to a given constellation of stimuli as a whole; the response itself being a constellation, or pattern, or gestalt." The following concept also seems important: "Integration occurs not by summa-

tion or subtraction or association but by differentiation, or by increasing or decreasing the integral complexity of the pattern in its setting. It appears that an integrated organism never responds in any other way." Various groups of individuals copied nine of Wertheimer's original patterns and their responses are analyzed in this study.

The maturation of the process in normal children correlated with chronological and later with mental age is contrasted with that of primitive children and defective adults. A performance test of the gestalt function standardized on 800 school and nursery children is presented in considerable detail with application to two illustrative cases. Corroboration of the findings was obtained by experimentation with optic imagery and the tachistoscope. Certain observations seem worthy of notice; scribbles, loops, perseverations and dextrad movement in the horizontal plane characterize the first responses in childhood. The latter quality appears to the author to be more of a determinant than Wertheimer's principles of proximity. In her opinion too, children's pavement drawings and games may be submitted to the same analysis. In this connection she quotes Koffka relative to the genesis of form in the perception of children as the outgrowth of motion. That the temporal factor is important was shown in the tachistoscopic experiments where the pattern experienced by adults was similar to that observed by the child. From the studies on mental defectives the author concludes that the concept of mental deficiency as a quantitative lack is an erroneous one. Her analysis leads to an etiological classification of this state under six headings, for example: simple retardation in maturation, dissociative phenomena which distort the whole personality, confusional disturbances.

Individuals suffering with psychiatric syndromes exhibited rather typical responses to the tests. Clinical improvement paralleled improved function in the performance. Further than that, in patients with sensory aphasia, "as the brain recovers from its insult the gestalt principles follow the laws of developmental maturation in returning to the higher integrative responses." Psychoses due to syphilitic meningo-encephalitis, alcohol and trauma are discussed in relation to their responses and these are contrasted with those of the functional group. The latter clearly indicate the underlying psychopathology in these disorders. Of considerable interest is the application of these tests to malingering. The author claims that by this method simulation in the test, or of a psychosis, is impossible. Schilder is quoted with reference to one of a series of psychoneurotic patients to the effect that estrangement concerning the outside world is often an estrangement especially in the optic sphere and that this is due to the enormous importance of the optic element in the construction of the body image.

The reviewer commends this book to the psychiatrist for its presentation not only of basic principles, but of clinical application. The study should be continued and expanded.

Moderate defects of style, a number of typographical errors, an incomplete index, and monotonous reference to another writer mar the volume to some degree.

NOTES

In March, 1939, Dr. John F. MacNeil, assistant superintendent of Matteawan State Hospital, was appointed superintendent of the Institution for Defective Delinquents at Napanoch, N. Y.

—For the fifth consecutive year, the psychiatric staff of the Menninger Clinic, Topeka, Kans., offers a one-week postgraduate course in neuropsychiatry in general practice April 17-22. This practical presentation of dynamic psychiatry through lectures and case presentations has been attended by physicians from 19 states in the past four years. Enrollment is limited to 30. Address inquiries to Dr. Robert P. Knight, Chairman.

—The department of institutions of the state of California has announced that treatment by means of malarial inoculation will be available for all suitable cases in seven of its state hospitals. Such patients will be admitted on voluntary application. Dr. Aaron J. Rosanoff, director of institutions, released this information to the press late in February, indicating that such provision was being undertaken as a preventive measure, aimed at the forestalling of syphilitic meningo-encephalitis.

—The downstate and upstate interhospital conferences of the New York State Department of Mental Hygiene are scheduled for the latter part of April. The Psychiatric Institute and Hospital in New York will be host to the representatives of hospitals in and near the metropolitan area; the upstate institutions will be served by the Utica State Hospital. Two themes have been chosen for the conferences this year: the alcoholic psychoses and psychoses with psychopathic personality.

—The Salmon Lectures for 1939 will be given at the New York Academy of Medicine, 2 East 103 Street, New York, on April 14, 21 and 28, by Dr. Dr. Edward A. Strecker, professor and chairman of the department of psychiatry, School of Medicine, University of Pennsylvania. Dr. Strecker's central theme will be "Beyond the Critical Frontiers." Lecture I will treat of The Massive Retreat from Reality, Lecture II will deal with Analysis of "Crowd-Mindedness," and Lecture III will discuss the feasibility of social mental hygiene and the significant role it must be prepared to play in any plan designed to redeem our cultures.